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INDUSTRIAL MEDICINE

Industrial Health, Occupational Medicine and Traumatic Surgery

February, 1946

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— For Use in Interviewing —

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— In Infected Wounds —

Fracture Problems
— Therapy by Internal and External Fixation —

Neuropsychiatric Aspects
— Of Industrial Accidents —

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— Under Prolonged Observation —

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— Its Practical Application —

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— Statistical Study —

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— Of Industry —

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1. Solis-Cohen, S. and Githens, T. S.: Pharmacotherapeutics, ed. 1, New York, D. Appleton and Company, 1928, p. 1375.
2. Tuft, L. and Levin, N. M.: Studies of the Expectorant Action of the Iodides, Am. J. M. Sc. **203**:717 (May) 1942.

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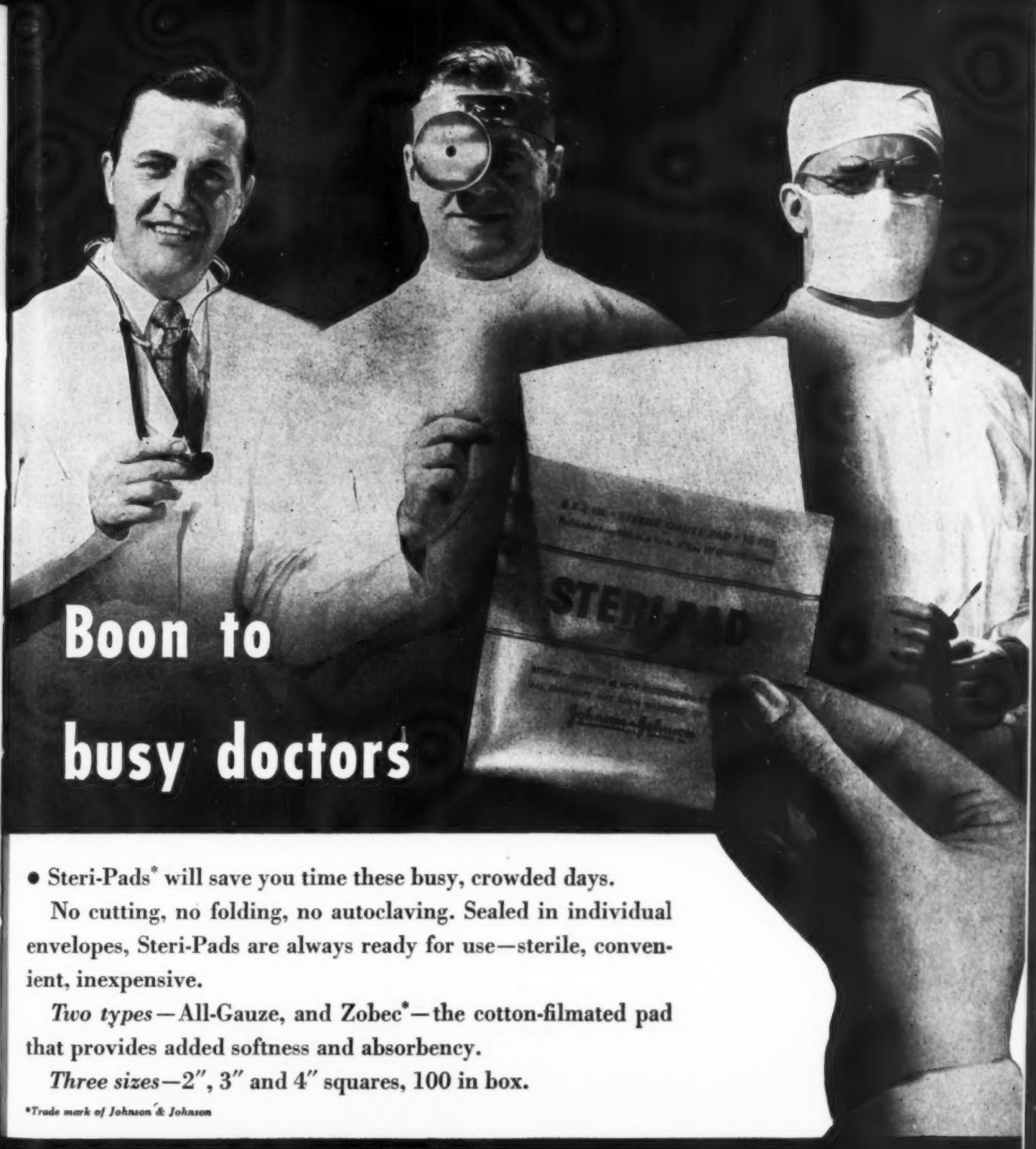

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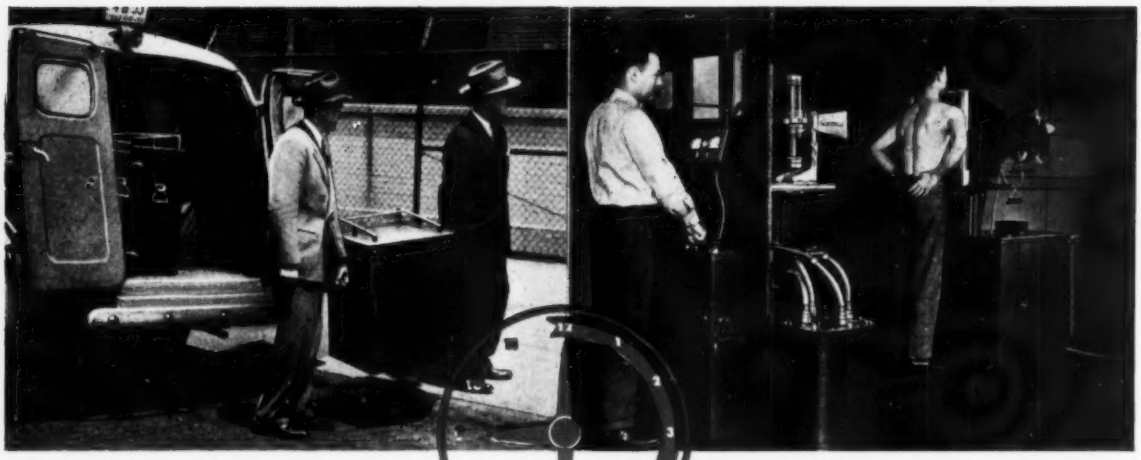

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THE PAGES of this issue have an almost international flavor. DRS. GRESH and JACKSON, "Dermatitis Control" (page 85), write from Toronto; DR. RICHARD SCHILLING describes "The Present Work of the Industrial Health Research Board Of Great Britain" (page 121); COLONEL FELTON treats of "Industrial Medicine in the Philippine Islands" (page 129); DRS. VICTOR BRITO A and AUGUSTIN LA CORTE, in their "Preliminary Examinations for Industry" (page 143), tell how they have applied certain accepted standards of physical fitness for applicants and causes for rejection to the preliminary examinations, for industry, of laborers and employees in Venezuela; and DR. EMMET DWYER, in "The Industrial Medical Centre" (page 152), outlines the industrial medical services of The Canadian National Railways and Trans-Canada Air Lines. There is no intentional apposition in the fact that these pages include also DR. FETTERMAN'S "Neuropsychiatric Aspects of Industrial Accidents" (page 96) and DR. BIERNOFF'S "Traumatic Neuroses of Industry" (page 109)—the possible inference that the international situation might profit from the services of those skilled in the understanding and treatment of psychoneurotic conditions is not inevitable here, although the international situation does exhibit many and assorted neuroses from the recent and terrible trauma of war. . . . ANOTHER item from across the water concerns the unmistakable crack-up of socialized, or government, medicine in New Zealand (page 28). Thus history repeats, and it becomes rapidly more apparent that, in truth, little would be heard of government health insurance in this country "except for the organized propaganda of do-gooders and of politicians who want to collect more taxes to provide more payroll jobs" to assure more votes to keep themselves in office.

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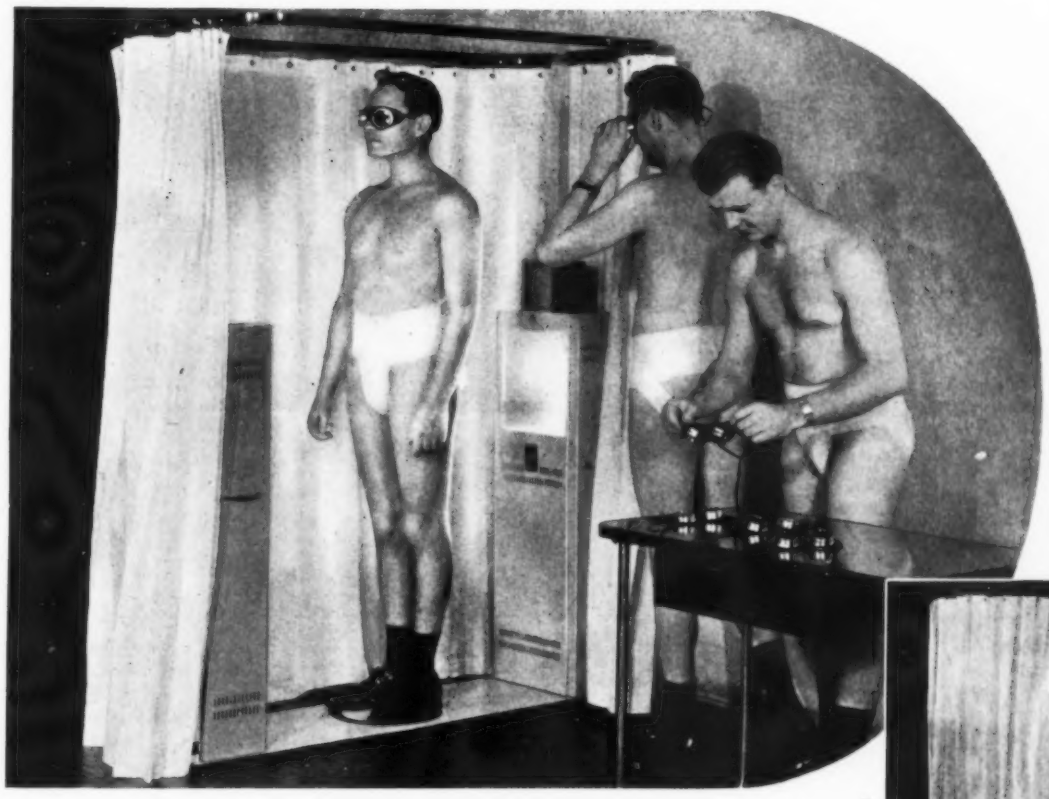

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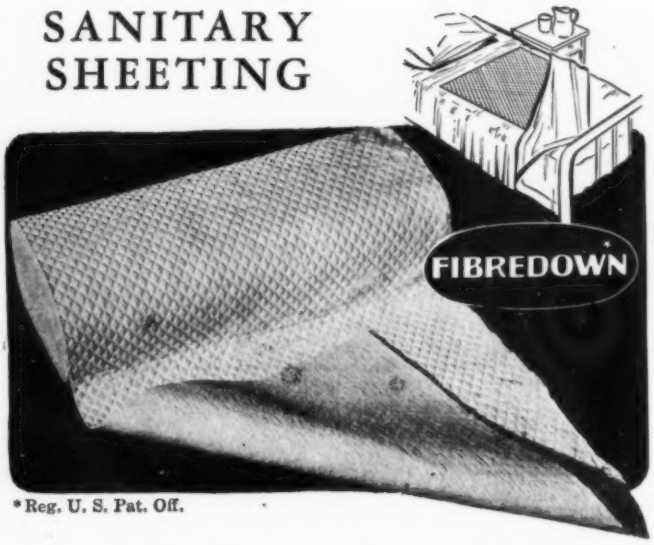

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PERSONAL

LIEUT. COL. JAMES W. LONG, after nearly five years in the Service, 42 months in the Pacific area, including Iwo Jima, is returning to his former position as Medical Director of the Gulf Oil & Refining Company at Port Arthur, Texas.

DR. V. GAILARD BACKMAN, returning from service in the U. S. Navy, has established his office, in the Cobb Building, Seattle, Washington, in association with DR. GRANT CALHOUN. His practice will be limited to occupational diseases and consultation in problems of industrial hygiene.

NEWLY elected officers of the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS are: President, DR. J. M. DUNNING; President-elect, DR. R. M. WALLS; Vice-President, DR. E. R. ASTON; Secretary-Treasurer, DR. L. D. HEACOCK; Directors, DR. E. R. GOLDHORN, DR. HAROLD HOOPER, DR. EARLE THOMAS, DR. L. S. MORVAY, and DR. C. R. FRICKE. These will hold office until the next regular annual meeting.

—From *Industrial Hygiene News Letter*, 5:12, 7, December, 1945.

THE 1945 "Industrial Management Symposium," put out by Consolidated Reporting Company, New York, includes the text of the Lecture at the Third Post-Graduate Course in Industrial Medicine (at Long Island College of Medicine) entitled "Health Education in Industry," by DR. FRANK M. GATTO, Director of Health Conservation, Westinghouse Electric & Manufacturing Company, Pittsburgh, as published in INDUSTRIAL MEDICINE, March, 1945, pages 192-195.

DR. JOSEPH P. HOLT, formerly associate professor of physiology at the University of Louisville School of Medicine, has joined the medical department of the Standard Oil Company as a specialist in toxicology. He will be responsible for original research in the biologic effects of toxic substances. DR. HOLT will also act as consultant and adviser to the company committee, representing all phases of the company's operation, which is charged with the elimination of potential hazards to workers. With the establishment of this branch of its medical department, Jersey Standard announces that it is the first oil company to undertake its own work in this field. Previously, research has been conducted in outside institutions and laboratories.

—From *J.A.M.A.*, 129:18, 1277, December 29, 1945.

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ROBERT STANLEY GOODHART, M.D., since March, 1943, chief of the Industrial Feeding Program Division, War Food Administration, Department of Agriculture, has been named Scientific Director of the Institute for Vitamin Research, Inc. DR. GOODHART recently returned from Japan, where he studied nutritional problems of the Japanese people. He expects to complete this project by March 1, when he will assume his new duties. The Institute, organized in 1944, proposes to maintain continuing research on "problems in nutrition, particularly as they relate to vitamins, to the end that the health and welfare of mankind may be improved through better nutrition," making grants to individuals and institutions for research and to provide scholarships and fellowships, and studying "proper standards for the manufacture and sale of vitamin products." DR. GOODHART is currently serving as vice-chairman of the Committee on the Nutrition of Industrial Workers, National Research Council, and chairman of the subcommittee on Nutrition and Industrial Fatigue. He has been a surgeon of the U. S. Public Health Service since November, 1944. At present he is on leave of absence as assistant professor of medicine, New York University. He is the author of many scientific publications on industrial nutrition.

JOHN B. LITTLEFIELD, Treasurer of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, has transferred from the Industrial Hygiene Division of the American Brake Shoe Company in Chicago to the Research Department, American Brakeblock Division of that company in Detroit. MR. LITTLEFIELD will be engaged in products development research.

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TO THE EDITOR:

CAPTAIN LLOYD TERRY, Chief, Public Relations, requests that I mail this letter to you in view of the fact that his name appeared as having written the article ("Industrial Medical Services") in your magazine (December). This article was actually written by WILLIAM S. JOHNSON, CAPTAIN, SN. C., Assistant, Industrial Medical Service of this command. Material was cleared by CAPTAIN TERRY and the War Department Bureau of Public Relations for publication, and anything that you may do to assure that CAPTAIN JOHNSON is given proper credit will certainly be appreciated by CAPTAIN TERRY and the undersigned as well.
—RAYMOND J. KAMINSKI, 2D, LT. AC,
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GENERAL

THE American College of Physicians will resume its Annual Meetings in 1946 and has now definitely chosen Philadelphia, May 13-17, inclusive. Headquarters will be at the Philadelphia Municipal Auditorium, 34th Street below Spruce. The meeting will be conducted under the Presidency of DR. ERNEST E. IRONS, Chicago, Illinois, and the General Chairmanship of DR. GEORGE MORRIS PIERSOL, Philadelphia, Pennsylvania.

Tribune Medical Service

DR. THEODORE R. VAN DELLEN, medical editor of *The Tribune*, reports that the medical counseler's office maintained by this newspaper provided 791 consultations in 1945. Of these, 750 were *Tribune* employees and 41 members of their families. In addition, the nurse's office on the 14th floor of Tribune Tower rendered first aid in 7,441 instances, and *Tribune* nurses made 991 calls at the homes of *Tribune* employees in the year. The *Tribune* also provides free dental services for its employees.

—*Chicago Tribune*, January 12, 1946.

Life Expectation

THE expectation of life for industrial workers in the United States actually increased during the war. Rising to 64.4 years in 1944, it was about a half year more than in 1943 and a full year greater than in 1941, our last year of peace, as reflected in the experience of industrial policy-holders of the Metropolitan Life Insurance Company.

—*Science News Letter*, 48:199, September 29, 1945, quoted in Lippincott's *Digest of Treatment*, December, 1945.

California

MANAGEMENT of the California and Hawaiian Sugar Refining Company, of Crockett, California, and the two unions representing its workers, one AFL and the other CIO, have cooperated in two highly successful health activities recently. A blood bank for company employees, with donors drawn from the membership of both unions, has been established at a hospital in Berkeley. A committee, made up of representatives of the unions and management handled all details, and men were

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paid full time for the afternoon spent in donating blood. Nearly 1,000 employees, two-thirds of all workers in the plant, took advantage of a group chest x-ray service arranged by similar management-union cooperation. The tuberculosis case-finding survey was conducted by the Contra Costa Public Health Association.

—*Industrial Hygiene News Letter*, 5:11, 7, November, 1945.

Hunter College

A COURSE in industrial hygiene is now being given for the first time at Hunter College. The growth of war industries and more recently the problems of reconversion have stimulated interest in the improvement of the health of the industrial employee. The course emphasizes knowledge gained from the research

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

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POTENTIATED ANTIBACTERIAL ACTIVITY—urea-sulfanilamide mixture more effective than either drug used independently.[1] Not inhibited by pus and tissue debris.

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1. Tsuchiya, H. M. et al: Proc. Soc. Exp. Biol. and Med., *50*:262, 1942.
2. McClintock, L. A. and Goodale, R. H.: U. S. Naval Med. Bull., *41*:1057, 1943.
3. Strakosch, E. A. and Clark, W. G.: Minn. Med., *26*:276, 1943. Brown, C. et al: Am. J. Surg., to be published.

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carried out in connection with industrial fatigue, and the importance of nutritional education and recreation facilities to enable the worker to maintain good health.

—From *New York Sun*, October 20, 1945.

Including the Health Record

THE Army-Navy "E" award was granted to 4,283 concerns for war production achievement. Only 5% of the war plants of this country received the honor. Outstanding production for the War and Navy Departments was the measurement for the award. Excellence in quality and quantity of production were two determining factors in the selections. Other factors were: (a) Overcoming of production obstacles; (b) low rate of absenteeism; (c) avoidance of work stoppages; (d) maintenance of fair labor standards; (e) training of additional labor forces; (f) effective management; (g) record on accidents, health, sanitation and plant protection; (h) utilization of subcontracting facilities; (i) cooperation between management and labor as it affected production, and (j) conservation of critical and strategic materials.

—From *New York Times*, December 6, 1945.

Accidents in Ohio

THE industrial workers of Ohio still have a penchant for getting their fingers into things, it is disclosed in a statistical study of Ohio's 1944 industrial accident record made by the statistical laboratory of the Division of Safety and Hygiene. The analysis of the 283,634 injury and occupational disease claims, as regards parts of the body affected by accidents, discloses that 70,437 of them had their origin in injuries to fingers. These included the loss of 1,667 whole fingers and 1,261 parts of fingers. Eye injuries rated second in accident frequency with 58,755 claims, which included the loss of 134 eyes. The injuries included 21,684 puncture wounds, 15,377 due to foreign body in the eye, 13,617 to lacerations, 4,355 to burns and scalds, 1,072 to contusions, and 107 to occupational diseases. During the year there were 1,414 traumatic amputations, 218 asphyxiations, 16,861 burns and scalds, 53,823 contusions, 656 dislocations, 15,377 foreign body, 18,259 fractures, 85,610 lacerations, 39,470 puncture wounds, and 8,249 occupational disease cases. In addition to the finger and eye injuries mentioned, there were 15,941 to the head and face, 38,963 to the trunk, 29,321 to the arms, 20,251 to the hands, 24,658 to the legs, 13,789 to the feet, and 11,519 to the toes. The 18,259 fractures included 829 to parts of head and face, 5,090 to fingers, 1,538 to legs, 2,028 to parts of the trunk, 1,673 to arms, 681 to hands, 1,655 to feet, and 4,765 to toes. Included in the list of injuries to the trunk were 5,157 hernia cases.

—From *O. I. C. Monitor*, September, 1945, quoted in *Ohio State M. J.*, December, 1945.

H. R. 525

THE Labor Department's bid to control industrial hygiene: On October 2 this bill was objected to and was stricken from the Consent Calendar in the House of Representatives. It can be revived only by a special rule from the Rules Committee.

—From *Nebraska State M. J.*, 30:12, 446, December, 1945.

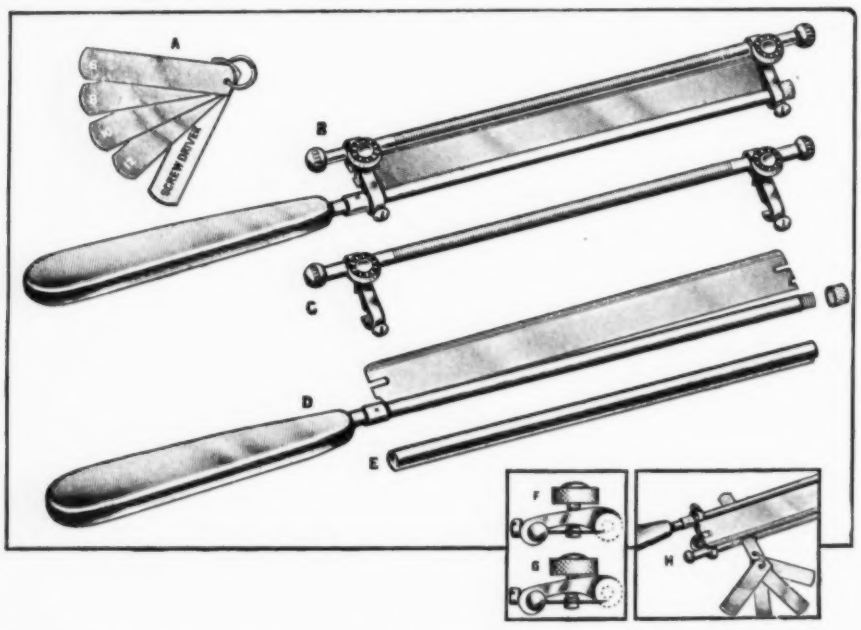
State Medicine Crack-up

NEW ZEALAND'S state medical system, which is supposed to grant "free" medical care to all, is breaking down under the weight of abuse by patients, doctors, and political meddling in general. It is reported that the government of New Zealand is seriously considering discontinuance of the system.

—From *Weekly Bulletin of the St. Louis Medical Society*, 40:1, 126, November 30, 1945.

Industrial Health Courses

CONTINUATION courses in industrial health currently announced are as follows: (1) LONG ISLAND COLLEGE OF MEDICINE, Medical Society of County of Kings and Academy of Medicine (1313 Bedford Avenue, Brooklyn 2) Fourth Post-graduate Course in Industrial Medicine, January 14-February 1, 1946. (2) WAYNE UNIVERSITY SCHOOL OF OCCUPATIONAL HEALTH (4072 Penobscot Building, Detroit 26) Occupational Health and Medicine, January 7, two weeks,



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At the suggestion of many users, the new Blair-Brown Skin Grafting Knife is now offered with a detachable blade and the Marck's Thickness Determining Attachment is now furnished with a set of four copper plate gauges for accurately regulating the thickness of the desired skin graft from 6 to 36 thousandths of an inch in 2 thousandths inch steps. In use, the gauges are selected for the desired thickness and are then placed between the knife edge and the threaded grip rod as shown in illustration "H" above. The knurled thumb screws at both ends of the Marck's Attachment then are adjusted until the space between the grip rod and knife edge provides a light tension on the gauges.

The detachable blade feature greatly reduces the cost of using the knife since extra blades are inexpensive and make it possible to own the equivalent of five knives at less than the former cost of two knives. These blades are made of razor steel and when properly stropped by the emery flour method before each operation have been used in twenty or more operations before needing honing. A honing tube, "E," is supplied with each knife to facilitate changing the angle for proper honing. A metal container which will hold seven blades is also included for use in storing and sterilizing the blades.

B-B967 — Modified Blair-Brown Skin Grafting Knife, "B," complete with one blade, Marck's Thickness Determining Attachment and set of four gauges..... **$18.50**

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*"Chlorophyll Urea Ointment in the Treatment of Burns and Chronic Ulcers." Industrial Medicine, 14:9, 730, Sept., 1945.

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combats febrile colds and influenza—an optimal combination of respiratory, circulatory and secretory stimulants—capsules or tablets.

Each tablet or capsule contains:

Dover's Powder	¼ gr.	Acetophenetidin	1½ grs.
Opium	1/40 gr.	Acetylsalicylic Acid	2 grs.
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Compounded as a quick vanishing cream with sufficient oily residue to form a protective film against *salt solutions, mild alkaline and acid solutions, dust powders and certain irritating vapors*. Being a vanishing cream, it is soothing in application.

A vanishing cream which is generally used as a protection against *dusts, powders, heavy oils, greases*, but is less resistant to water vapors than West Protective Cream No. 11.

Designed to protect the skin against organic solvents such as *kerosene, gasoline, carbon tetrachloride, xylol, lacquer thinners, paints, enamels and lacquers*. Washes from skin readily with soap and water and does not dissolve in the organic solvents. This cream also protects the skin against dusts and certain vapors.

A heavy bodied cream possessing special cleansing ingredients as well as special materials scientifically combined to protect against *certain aqueous* and *alkaline solutions*.

This cream is primarily resistant against aqueous solutions and is recommended against *detergent solutions, alkaline solutions, cutting oils, vapors, dusts*, and such other harmful materials that would ordinarily penetrate through the aforementioned protective creams.

This cream contains Zinc Oxide and Benzoic Acid and is acid in reaction, being recommended against irritating alkaline conditions affecting the skin. While basically it functions as a cold cream, it is more specific for *alkaline conditions* than West Protective Cream No. 44.

Contains a chemical photodesensitizer, and a bland pigment to protect against the action of *Coal Tar Compounds, Petroleums, Tar, Pitch* and like substances, and is a protection against actinic rays when they act as an external irritant in conjunction with the above compounds.

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full time. (3) COLUMBIA UNIVERSITY —At: New York Post-Graduate Medical School (303 East 20th Street, New York 3) Symposium on Industrial Medicine, June 17-21, 1946, five days, full time. (4) UNIVERSITY OF TEXAS SCHOOL OF MEDICINE (912 Avenue B., Galveston, Texas) Industrial Medicine, March, 1946.

COMMENT and OPINION

HEALTH authorities are becoming increasingly aware that many diseases are uncontrollable without the active participation of the people themselves.

—From *Public Health Reports*, 60:47, 1401, November 23, 1945.

A PHYSICIAN doing research at the University of California reports that cobra venom in some manner effects a cure for color blindness. The discovery was made during experiments of its use as an anesthetic. When testing it on a group of color blind army volunteers, only one failed to pass the standard color test after injections of the venom. It was also discovered that the venom has a facility for making all of the senses keener and sharper.

—From "Hospitalics," in *Hospital Topics & Buyer*, 23:12, 19, December, 1945.

Tip to the Cafeteria

IN THE MASS feeding of navy men in this country it was observed that they generally eat about 12% of their calories outside the regular mess hall, and it is suggested by McCay that the candy bars and pastries purchased be improved from the nutritional point of view. It is well known that poor cookery and the serving of strange foods will lead to heavy wastage, particularly of foods planned by the dietitian for their vitamin content, and this can be prevented only by a suitable educational campaign.

—From *Nutritional Reviews*, November, 1945.

Industrial Nursing

SHOULD a course in industrial nursing be included in the basic nursing curriculum? No, maintains the advisory committee on industrial nursing of the NOPHN and the AAIN. They point out that the undergraduate curriculum is intended as a foundation only, and that for greater responsibility or specialized service, the student must obtain more experience and some special post-graduate study. However, why don't schools of nursing examine carefully their own curricula for possible emphasis on the industrial implications? is a counter question. For instance: (1) The health program of the school of nursing and the hospital personnel has, in general, the same aims as an industrial health service, and more attention could be given to these as such. (2) The prevention of accidents and the many first aid and emergency nursing opportunities in the hospital should be emphasized, as well as the application of the Workmen's Compensation Law, as illustrated by the hospital program. (3) Every opportunity or situation should be seized to emphasize the industrial implications of nursing in every theoretical course and every clinical service.

—From *Hospital Topics & Buyer*, 23:12, 56, December, 1945.

Health Cooperation

PROVISION for health-benefit programs as a part of the contractual relationship between employers and unions was almost unknown a few years ago. Although a number of companies had provided within-plant medical service to their employees for many years and a few had established group health-insurance programs, these were administered by the employer and were subpect to alteration or discontinuance at his will. Many were started as a part of a general welfare program designed to win employee loyalty and discourage union organization. Organized labor, having no voice in their administration and suspecting the motives for which they were established, has never wholeheartedly endorsed company benefit plans. In response to their members' need for protection against total loss of income during sickness, a number of unions have established benefit programs of their own which are financed through membership dues or special assessments. Many of these, however, cover permanent disability and old age rather than short periods of illness. During recent years an increasing number of unions have succeeded in having health-benefit plans included in the terms of their agreements with em-

Meakins*, discussing the treatment of acute rhinitis, suggests the use of aspirin several times daily as a means of affording symptomatic relief.

An improved method of prescribing acetylsalicylate and assuring a concomitant intake of fluid is provided in—

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CLINICAL ADVANTAGES: The buffer-alkali mechanism, together with the CO_2 factor of the effervescent base, combines to

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Make preparation readily available for absorption—enhancing (augmenting) analgesic effect

Available through your prescription pharmacy in bottles of 25 tablets.

*Meakins, J. C.: The Practice of Medicine, St. Louis, The C. V. Mosby Company, 1940, p. 23.

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Brougher, John C.: We
520-521 (Dec.) 194

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ployers, and several international unions have established special facilities for helping their locals negotiate such plans. Although a number of the provisions in current agreements signify the substitution of contractual arrangements for already established employer-administered or union-administered benefit plans, many of them are new; some of the latter have been negotiated in lieu of wage increases which could not be obtained under the wartime wage stabilization program. To strengthen their case for employee participation in administration, some unions favor the policy of having employees contribute toward the payment of premiums. On the other hand, some unions have obtained virtual control of administration of programs which are financed entirely by employers. In a majority of cases the health-benefit programs are underwritten by private insurance companies; such group policies usually include, in addition to the sick-benefit provisions, accidental-death and dismemberment benefits.

—From "Health Benefit Programs Established Through Collective Bargaining," *Monthly Labor Review*, August, 1945.

Examinations Worthwhile

MEDICAL examinations for workers employed in industrial plants are one of the most important means of improving the national health, according to the Cedartown Chamber of Commerce Health Committee. A major and important portion of the nation's population is made up of industrially employed wage earners. Just as mass health surveys in schools provide an excellent means of early detection and prompt treatment of various diseases among children, so do mass health surveys in industry provide means for finding and treating disease among millions of adults. Such case-finding campaigns are an important contribution to public health and they reduce absenteeism among workers, and increase production and earnings. Representatives of the medical profession, industry, and labor organizations recognize the value of surveys in industry to discover and bring to treatment cases of tuberculosis, and venereal and other diseases. Some of the essentials for effective case-finding programs in industry include: advance information among local doctors, health authorities and other groups concerned, regarding purposes of, and plans for, contemplated health surveys; availability of competent and experienced personnel, including physicians, for conducting the survey and interpreting results of examinations; referral for further diagnosis and treatment of individuals needing medical attention to community physicians and other established community facilities; and provision for reporting communicable diseases in accordance with health department regulations.

—From *Cedartown (Georgia) Standard*, November 27, 1945.

Delayed Poisoning from Benzol

THE length of time which may elapse after exposure to benzol before symptoms of bone marrow damage appear is of considerable interest in diagnosis in cases of aplastic anemia. It is known that the effects of benzol poisoning are often slow to disappear, but it may not be so well known that the poisoning may be delayed in making its appearance. A case is reported in which death from aplastic anemia due to benzol poisoning occurred four years after the patient had left the work in which he was exposed to benzol. Had careful periodic blood or bone marrow studies been made, the author believes, the condition might have been detected earlier. He states that periodic check-ups are to be recommended, since benzol exposure may constitute a continuing liability to the health of the individual exposed almost indefinitely after cessation of exposure.

—*What's New*, September, 1945, published by Abbott Laboratories; abst. from an article by A. R. SMITH in *J. Industrial Hyg. & Tox.*, 27:118, April, 1945.

High Cost of Lost Executives

THE PUBLIC business—specifically the operation of Federal agencies, bureaus and departments—is vast and complex. It can be entrusted only to competent men and women. Yet there has never been any ordered analysis of the cause and effect of the persistent parade of higher income civil servants from the Federal government. . . . But at last the problem of retaining men and women of ability and initiative in the civil service jobs paying from $5,000 to $9,000 has been forced to

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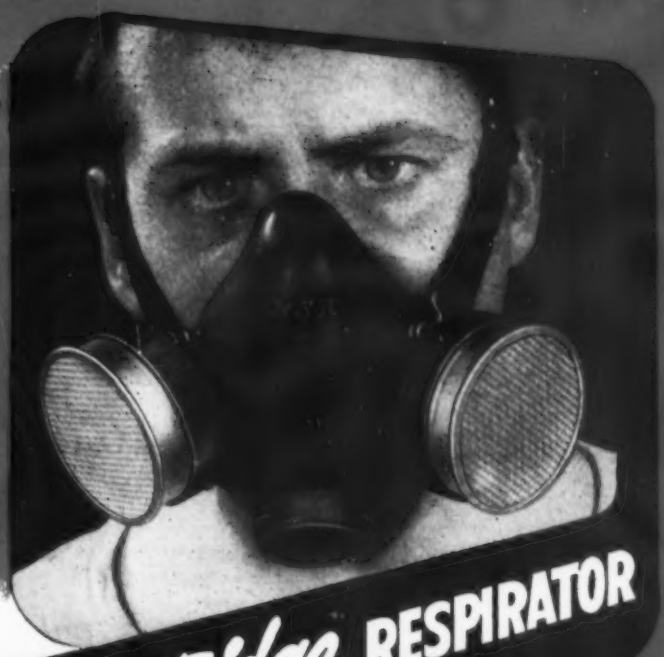

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Safety engineers, long concerned with respiratory hazards to workers from light but harmful concentrations of organic vapors, will welcome this new M.S.A. Chemical Cartridge Respirator—officially approved by the U. S. Bureau of Mines! Now, approved protection is available against benzene, acetone, carbon tetrachloride, alcohol, ether, formaldehyde, toluene, gasoline, petroleum distillates and other hazards—joined with advanced new comfort, easy fit, balance, and simplicity of cleaning and maintenance. *Write for the descriptive details.*

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A single tablet chewed for *one-half to one hour* promptly provides a *high* concentration of locally active sulfathiazole (average 70 mg. per cent). This high concentration is sustained throughout the entire chewing period, in immediate contact with infected oral mucosal surfaces. Moreover, resultant blood levels of the drug, even with maximal dosage, are so low (rarely reaching 0.5 to 1 mg. per cent) that systemic toxic reactions are virtually obviated.

INDICATIONS: Local treatment of sulfonamide-susceptible infections of oropharyngeal areas; acute tonsillitis and pharyngitis; septic sore throat, infectious gingivitis and stomatitis, including acute Vincent's disease.

DOSAGE: One tablet chewed for *one-half to one hour* at intervals of one to four hours depending upon the severity of the conditions. If preferred, several tablets—rather than a single tablet—may be chewed *successively* during each dosage period without significantly increasing the amount of sulfathiazole systemically absorbed.

Available in packages of 24 tablets, sanitaped, in slip-sleeve prescription boxes.

a product of **WHITE LABORATORIES, INC.** *phar*

m method,

"I believe the concentration of sulfathiazole can be maintained in the mouth . . . for some time, since the solubility of the drug is constant."

—*Correspondence: J.A.M.A., 122:1204 (Aug. 21) 1943.*

White's

SULFATHIAZOLE GUM*

IMPORTANT

Please note that your patient requires your prescription to obtain this product from the pharmacist.

c. *pharmaceutical manufacturers, Newark 7, New Jersey*

WHAT YOU GET IN A CAMBRIDGE

	FULLY DEVELOPED
	PROVEN ACCURACY
✓	ACCEPTABLE RECORDS
	LONGEVITY
	PRECISION BUILT
	OBVIOUS VALUE

"The standard of comparison...everywhere"

The accuracy of Cambridge Records has been recognized by the medical profession since the introduction of the Cambridge Electrocardiograph over a quarter of a century ago. The science of Electrocardiography in this country has been developed almost entirely with the CAMBRIDGE.

From his student days and throughout his practice the Cardiologist has learned to unhesitatingly depend upon the findings of this precision instrument. Today Cambridge records are the standard of comparison everywhere. The CAMBRIDGE is a rugged instrument, simple and convenient to operate. It is fundamentally sound in design, made of the finest materials by skilled instrument makers.

THE "SIMPLI-TROL" PORTABLE MODEL. MOBILE AND STATIONARY MODELS ALSO AVAILABLE

The universal acceptance of Cambridge Records is reason in itself why the discriminating Cardiologist selects the CAMBRIDGE as his instrument. Its many other advantages are plus value.

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PIONEER MANUFACTURERS OF THE ELECTROCARDIOGRAPH

CAMBRIDGE
all-electric
ELECTROCARDIOGRAPH

ANY MODEL MAY BE ARRANGED TO RECORD HEART SOUNDS AND ELECTROCARDIOGRAM SIMULTANEOUSLY.

CAMBRIDGE INSTRUMENT COMPANY, INC., 3716 Grand Central Terminal, New York 17, N. Y.

the surface. Civil Service Commissioner Arthur Flemming posed it squarely before the Senate Civil Service Committee on November 2. At the moment it appears probable that for the first time in 17 years—since the passage of the Welch Act in 1928—the problem of retaining professional, scientific, and administrative personnel in the Federal government will at least be faced openly. During these same years, the organized strength of the lower paid Federal employees has forced the raising of their salaries in much greater proportion by the Pay Act of 1945. During the same period, while the cost of living increased substantially, the salaries of the upper level civil servants have received scant attention. Hurried canvasses of the consequent losses of top-level personnel during these years by a number of departments summarize the results of the policy that has prevailed. These results, too, when coupled with the observations of men who have lived with and observed the Federal service during the past two decades, indicate who these emigres are and why they leave. Among the annual crop of resigning civil servants there are always a number of highly competent scientific personnel from such agencies as the Food and Drug Administration, the Department of Agriculture, the Bureau of Standards, and the Public Health Service. Take for example the case of LOUIS H. M..... He attained the grade of medical officer P-4 $3,800 in the Food and Drug Administration in 1941 after approximately five years' service. He might look forward eventually to the prospect of becomin an assistant commissioner at $6,500. This goal was remote. And hence when offered $10,000 to become medical director for one of the national airlines, he accepted and left.

—From "The High Cost of Lost Executives," by JOHN J. CORSON in *Personnel Administration*, 8:4, 1-5, December, 1945.

Noise

DOCTORS have discovered that noise hastens heart action, raises blood pressure and cuts down efficiency as much as 30% and 40%. In hospitals, where quietness is essential, the need has been felt perhaps more than anywhere else. By covering the walls and ceilings with a sound-absorbing material and installing a floor of non-reverberating material, harsh jarring noises are practically eliminated. Restaurants formerly shunned unconsciously because of excessive clatter have found business picking up, thanks to the same treatment. In theaters and churches where dead spots, echoes and whispering galleries have plagued audiences, an architect can usually remedy the situation by studying and changing the acoustic properties. Many business heads have discovered that by cutting down office noises—lessening the jangling of telephones and the clattering of typewriters—not only is their office a pleasanter place to work in but production is speeded up, mistakes are minimized and there are fewer days lost by employees.

—From "Noise Control Speeds Output," in *N.N.A.C. News Bulletin*, 4:7, 3, December 5, 1945, quoting *Fort Wayne*, Indiana, *News Sentinel*.

Not on the Red Side

MAJOR THOMAS discussed the job of selling industry on industrial hygiene. He pointed out that probably this would have to come about by convincing management that the application of industrial hygiene is economically sound and good business. He stated that most plants consider such an activity on the red side of the ledger, and in order to put across any industrial hygiene program, management must be convinced that this is a paying proposition. As an approach to this selling job, he said that industrial hygiene should be considered as a necessary part of the production schedule of any plant. When management has come to think of industrial hygiene in terms of production and productive ability of the individual worker, then the selling job has been satisfactorily completed. . . . N. V. HENDRICKS, CH. E., President, Georgia Section, A.I.H.A.: "Major Thomas mentions that in many plants any concern of indus-

. . . the characteristic response

THE prompt symptomatic relief provided by Pyridium is extremely gratifying to the patient suffering with distressing urinary symptoms such as painful, urgent, and frequent urination, tenesmus, and irritation of the urogenital mucosa.

Pyridium is convenient to administer, and may be used with complete safety throughout the course of cystitis, pyelonephritis, prostatitis, and urethritis. *The average oral dose is 2 tablets t.i.d.*

PYRIDIUM
REG. U. S. PAT. OFF.
(Phenylazo-alpha-alpha-diamino-pyridine mono-hydrochloride)

For gratifying relief of distressing symptoms in urogenital infections.

Pyridium is the United States Registered Trade-Mark of the Product Manufactured by the Pyridium Corporation.

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

"Total" Therapy

FOR INDUSTRIAL DERMATITIS

"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area—because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

With tissue repair under way, and only erythema remaining, the use of **Domeboro Ointment** (each ounce of which, in a special hydrophilic base, possesses the therapeutic action of one Domeboro Tab diluted in a pint of water), permits a quicker return to work, while healing is promoted by its efficient topical action.

(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

Samples and full details gladly sent on request

DOME CHEMICALS, INC.
250 EAST 43rd STREET • NEW YORK 17, N. Y.

Canadian Distributor: F. J. Whitlow & Co., Ltd., 165 Dufferin Street, Toronto, Ont., Canada
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trial hygiene is assumed to be placed on the red side of the ledger. I disagree with this evaluation of industrial hygiene. In substantiating this opinion I bring to you the experience of the St. Joseph Lead Company which is one of the largest producers of lead in this country. For a number of years, this company has actively and scientifically applied industrial hygiene procedures to its plant operations and to its plant personnel. Accurate records have been kept of the cost of this program and statistical and financial analyses of the results have been compared. According to MR. ANDREW FLETCHER, who is vice-president, secretary-treasurer of this company, industrial hygiene in their organization has paid returns which can be expressed to their way of thinking in a very tangible form. The analysis of their experience indicates that these procedures have returned to the company an average of $70.00 per year per employee. This company employs around 5,000 people so that by simple arithmetic we arrive at a net annual saving to the company of something like $300,000."

—From "Minutes covering the Organization Meeting of the Georgia Section, American Industrial Hygiene Association."

"Strategy" in Washington

NO MYSTERY is attached to the "strategy" of the pressure boys behind the Truman Health Insurance bill in deleting from this administration-sponsored version of the Wagner-Murray-Dingell bill, which has been in ill repute in and out of Congress for many months, all reference to an appropriation for administration and to an increase in social security taxes. By eliminating this section, the Finance Committee of the Senate and the Ways and Means Committee of the House were by-passed, and we find the Truman bill in the lap of Senator Murray's committee on education and labor, and the House bill in the custody of the interstate commerce committee. Although Senators Wagner and Murray and Representative Dingell are now calling signals, Senator George and his powerful Finance Committee have to be reckoned with before the battle is over. The bureaucratic boys who have been watching the W-M-D bill gathering dust in the files of the Senate Finance Committee for a long time, and who are now seeking to take over medicine via the Truman bill, lost sight of the fact that Senator George will have to be given the ball sometime, as you can't administer socialized medicine without funds, and the Finance Committee will have something to say about any appropriation that might be needed for this purpose.

—*West Virginia Med. J.*, January, 1946.

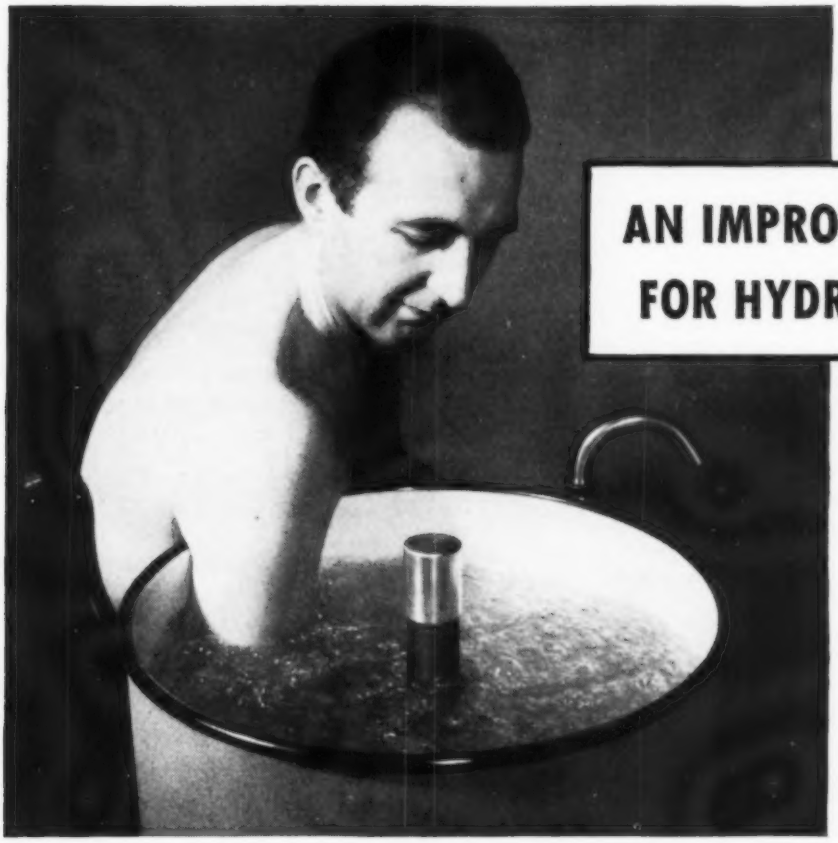
We're Against It

WE ARE unalterably opposed to the Wagner-Murray-Dingell Bill for the following reasons: It is un-American; it is inordinately expensive, involving an 8% pay roll tax up to $3,600 of income, and this probably inadequate. In fact, a recent economic survey indicates that with a national income of $120,000,000,000 a 15% to 17% tax will be necessary, and even this, perhaps, is inadequate. It sets up another Federal bureaucracy with a lay board—the Social Security Board—at its head, to decide all medical matters, and although the administrative head is the Surgeon General, who incidentally usually is, but need not by law be, a physician, nevertheless he is an appointive, not an elective, official and he is subject to the dictates of this lay board; a third party, namely the government, is brought between the doctor and the patient, and the doctor is responsible to that third party. A poor type of medical care is encouraged—quantity without regard to quality. Inefficiency, red tape, and political medicine will result. Should the bill be enacted, government control would cover not only doctors but eventually dentists, nurses, technicians, hospitals, medical and hospital supplies, and equipment. Notwithstanding Senator Wagner's claim that this bill is not socialized medicine, it is just that. It is paternalistic and inevitably will lead to national socialism."

—From "Why United States Doctors Oppose Regimentation," in *J. Indiana State M. A.*, January, 1946, quoting *J.A.M.A.*, December 1, 1945.

It Doesn't Work

QUENTIN POPE, staff writer for the *Chicago Tribune*, which paper is decidedly opposed to any form of socialized medicine, writes from New Zealand under date of Novem-



AN IMPROVED DEVICE FOR HYDROTHERAPY

The "Rocke" Hydrotherapy Bath is indicated for the treatment of many conditions of the extremities where the combined effects of heat and massage are desired—such as painful stumps, painful and adherent scars, purulent wounds, indolent ulcers, inflammations of joints, and post-operative fractures of the extremities.

This bath combines temperature and the associated production of hyperemia, with the massaging action of aerated water—thus a stroking effect is produced which simulates manual massage. The vigorous action of the water is produced vertically, along the injured extremity, and can be controlled by the air intake valve.

A sturdily constructed unit—streamlined, compact, self-contained—for use in hospitals or in the doctor's office. No plumbing connections are required. It is equipped with a motor-driven pump for drainage to either a sink or floor drain.

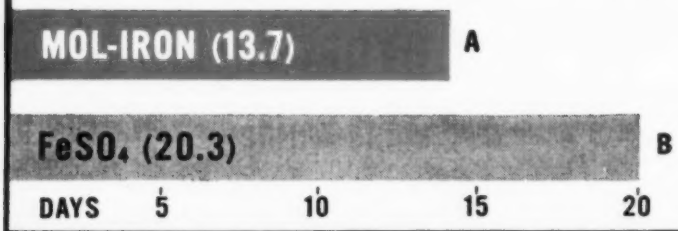
Full information can be obtained from your nearest G-E X-Ray Branch Office, or General Electric X-Ray Corporation, 175 W. Jackson Boulevard, Chicago 4, Illinois. Dept. D42.

Accepted by the Council on Physical Therapy, American Medical Association.

GENERAL ELECTRIC X-RAY CORPORATION

A NEW AND DEFINITE ADVANCE

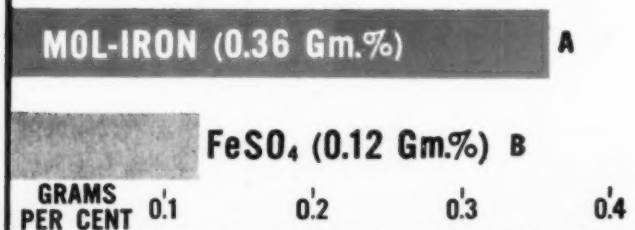
RAPIDITY OF CLINICAL RESPONSE (Days)



(A) Completely effective therapeutic response (return to normal blood values) was obtained in an average of 13.7 days of Mol-Iron therapy.

(B) Ferrous sulfate therapy *failed* to produce normal hemoglobin values after an average of 20.3 days.

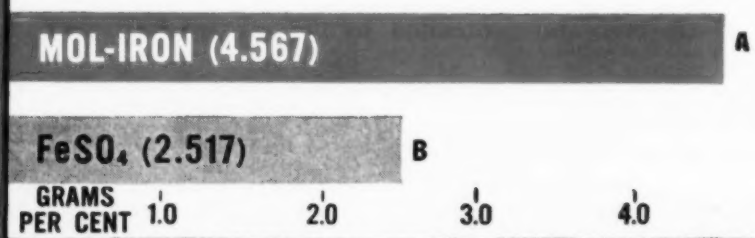
AVERAGE DAILY HEMOGLOBIN INCREASE (Gm. Per Cent)



(A) The group treated with Mol-Iron averaged a daily hemoglobin increase of 2.48 per cent (0.36 Gm. per cent).

(B) The group treated with ferrous sulfate showed an average daily gain of hemoglobin of 0.83 per cent (0.12 Gm. per cent)—a response about one-third as effective.

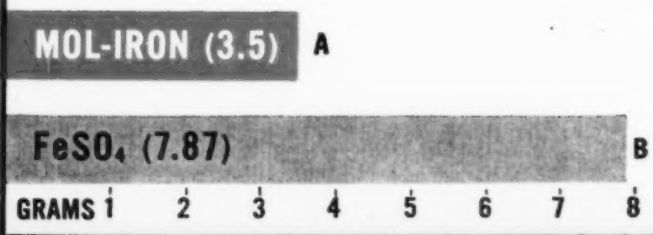
TOTAL HEMOGLOBIN INCREASE (Gm. Per Cent)



(A) The total hemoglobin increase (in an average of 13.7 days) averaged 31 per cent (4.56 Gm. per cent) in the Mol-Iron treated group.

(B) A mean gain of only 17 per cent (2.51 Gm. per cent) hemoglobin resulted in an average period of 20.3 days during which the ferrous sulfate treated group was observed.

THERAPEUTIC INTAKE OF BIVALENT IRON (Gm.)

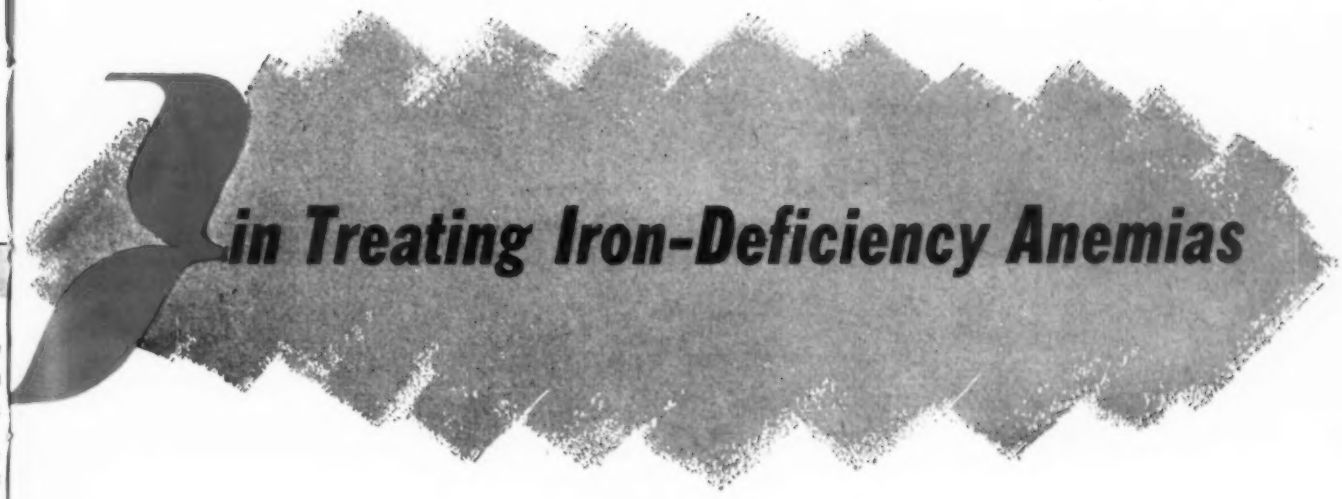


(A) The Mol-Iron treated group received an average total of 3.528 Gms. of bivalent iron to produce the sought for result (return to normal blood values).

(B) While an average ingestion of 7.871 Gms. of bivalent iron failed to achieve an optimal response in the ferrous sulfate treated group.

The charts summarize the results of a controlled study of comparative therapeutic response in post-hemorrhagic and nutritional hypochromic anemias.

The series includes 49 cases treated with Mol-Iron and 21 with exsiccated ferrous sulfate; the results are typical of those observed in treatment of iron-deficiency anemias with White's Mol-Iron.



in Treating Iron-Deficiency Anemias

A specially processed, co-precipitated complex of molybdenum oxide (3 mg.) and ferrous sulfate (195 mg.).

White's MOL-IRON TABLETS

Available clinical evidence indicates that, in hypochromic anemia, the therapeutic response to this highly effective synergistic combination—as compared with equivalent dosage of ferrous sulfate alone—has unusual advantages:

1. NORMAL HEMOGLOBIN VALUES ARE RESTORED MORE RAPIDLY, INCREASES IN THE RATE OF HEMOGLOBIN FORMATION BEING AS GREAT AS 100% OR MORE IN PATIENTS STUDIED.
2. IRON UTILIZATION IS SIMILARLY MORE COMPLETE.
3. GASTRO-INTESTINAL TOLERANCE IS NOTABLY SATISFACTORY—even among patients who have previously shown marked gastro-intestinal reactions following oral administration of other iron preparations.

INDICATED IN: Hypochromic (iron-deficiency) anemias caused by inadequate dietary intake or impaired intestinal absorption of iron; excessive utilization of iron, as in pregnancy and lactation; chronic hemorrhage.

DOSAGE: One or two tablets three times daily after meals.

Available in bottles of 100 and 1000 tablets. Ethically promoted—not advertised to the laity.

PHARMACEUTICAL White LABORATORIES, INC. NEWARK 7, N. J. MANUFACTURERS

Adjuvant Topical Therapy

IN

JOINT AND MUSCLE AFFECTIONS

While systemic measures are often adequate in controlling the discomfort arising from arthritic joints, chronic bursitis, and myositis, local therapy usually affords beneficial results. Active hyperemia and massage improve blood disposal of noxious metabolites and aid in the reparative and resolving processes. Baume Bengué provides the type of influence needed. Containing menthol and methyl salicylate, it improves local blood supply through its counterirritant action, and aids in raising the salicylate level through cutaneous absorption of its contained methyl salicylate. Furthermore, Baume Bengué satisfies the patient's desire for "something to apply."

Baume Bengué

ANALGÉSIQUE

THOS. LEEMING & CO., INC., 155 EAST 44TH STREET, NEW YORK 17, N. Y.

ber 27, commenting on the results of state medicine in that large community. Among other things, he says that the hospitals of New Zealand are filled to more than normal capacity by patients, many of whom show no desire to leave these institutions even though they probably would get along as well in their own homes after the acute stage of their illness is past. They experienced no little difficulty in finding bed space for vitally-ill patients as a result of the overcrowding. In many instances families who tire of caring for semi-invalids see to it that they are taken to the hospital for an indefinite stay. When this system was first instituted some six years ago, it was estimated that the annual cost would be about five million dollars; it is now found that the cost amounts to more than five times that sum, with the costs increasing daily. Along with these ills it has been discovered that there is a "medical racket" of no mean proportions, in that certain medical men take full advantage of the system and crowd these patients into the hospitals where the medical man can make dozens of "calls" in a short space of time. It is openly charged that in some instances a physician is enabled to make these calls in one afternoon of each week, billing the government for thousands of dollars yearly. It also has been found that prescriptions signed by the doctor are left with the druggist, and the patient calls for his medicine without having seen the doctor. There is little or no choice of physician; the patient takes whoever may be assigned to treat him. If it is a surgical case and the patient has no liking for the assigned surgeon he may choose one of his own, but in that case he will have to pay the surgical fee. The writer concludes, "along with these things has been the promotion of a morbid psychology among people now more conscious of their aches and pains than ever before." Thus, we have another example of government-controlled medicine—it simply does not work out.

—Editorial Note in *J. Indiana State M. A.*, January, 1946.

The Reasons

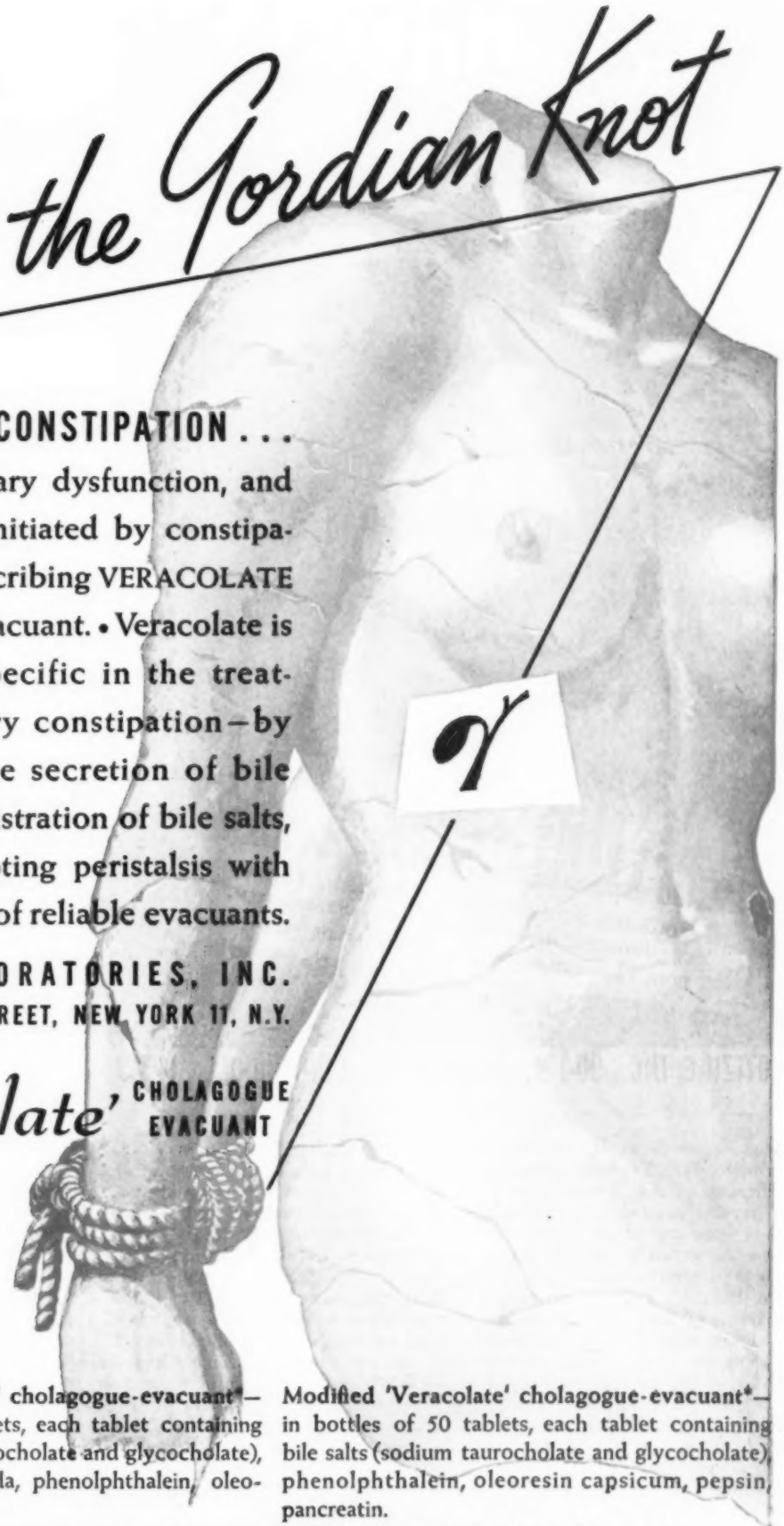
UNDOUBTEDLY there are many and varied reasons for enactment of so little compulsory sickness legislation in the states. It is often difficult to ascertain why certain bills are treated with either open opposition or complete indifference, but some of the reasons for the lack of enthusiasm displayed in the states for legislation of this type are revealed in the several reports mentioned earlier in this paper. A brief summary follows: (1) The passage of compulsory sickness insurance legislation would be an entering wedge into the field of compulsory budgeting of personal expenditures and would amount to "an infringement on an individual's liberty." (2) During the present emergency people have been encouraged to buy war bonds, thus building up cash reserves, and there should be relatively few who will be unable to care for themselves for some time to come after the war. (3) In spite of much employment and higher incomes, the burden of taxation is already so great that both workers and employers can ill afford to pay for additional insurance. (4) Group insurance plans between employers and employees and private hospitalization plans especially designed for the low- and middle-income groups have developed at a phenomenal rate, thus lessening the need for compulsory insurance. (5) State legislation may be retarded in some states because of uncertainty concerning possible government centralization of all types of social insurance, including a new Federal program of permanent and temporary disability.

—From "State Compulsory Health Insurance, 1939-44," *Public Health Reports*, December 28, 1945.

Cracking the Whip

SURGEON GENERAL PARRAN, of the Public Health Service, who hopes to become the high mucketty-muck of socialized medicine, is swinging the whip on his subordinates to make them lobby for the pending Wagner-Murray-Dingle bills, which Mr. Truman favors. "Every officer of the public health service," DR. PARRAN has informed his staff, "will wish to familiarize himself with the President's message and will be guided by its provisions when making any public statement likely to be interpreted as representing the official views of the public health service." This is not the first time that Mr. Truman's administration has undertaken to make public employees a claque for whatever view the

Cut the Gordian Knot



OF BILIARY CONSTIPATION . . .

caused by biliary dysfunction, and biliary stasis initiated by constipation . . . by prescribing VERACOLATE cholagogue-evacuant. • Veracolate is simple and specific in the treatment of biliary constipation—by stimulating the secretion of bile through administration of bile salts, and by promoting peristalsis with small amounts of reliable evacuants.

MARCY LABORATORIES, INC.
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'Veracolate' CHOLAGOGUE EVACUANT

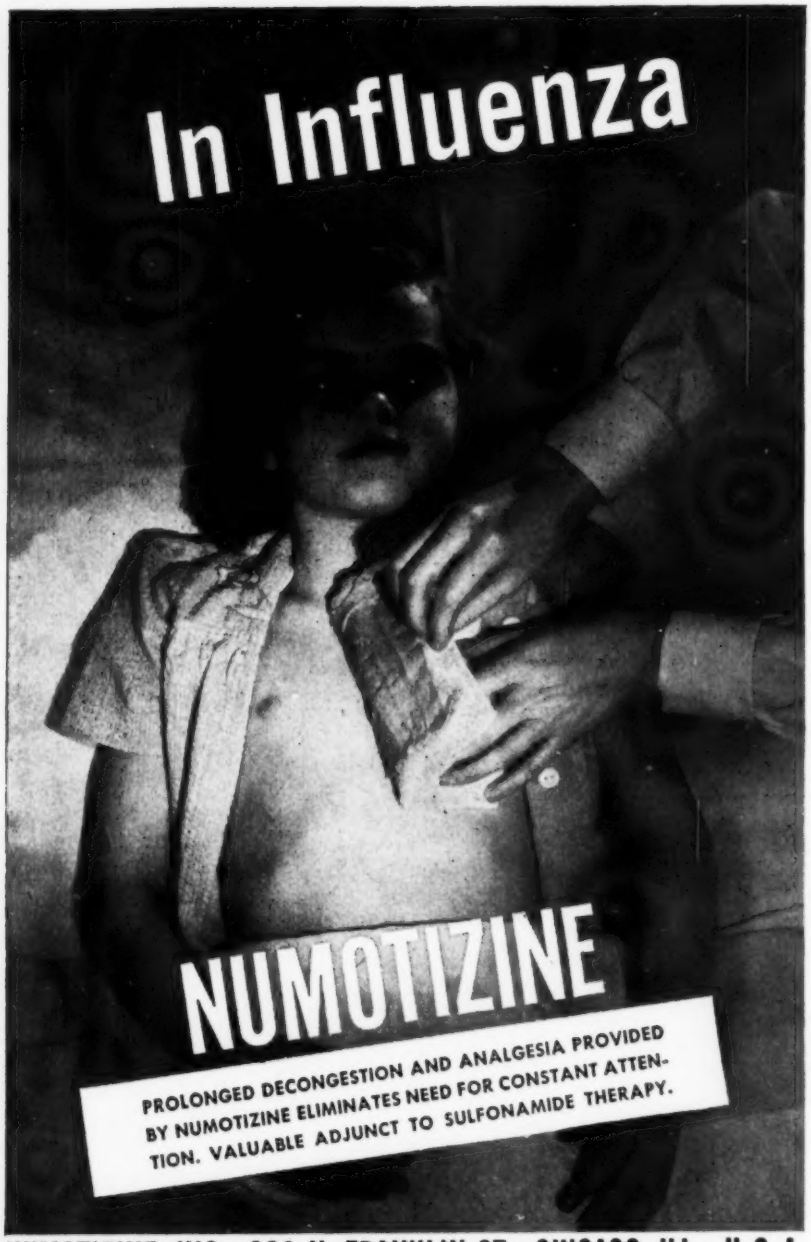
SUPPLY: 'Veracolate' cholagogue-evacuant*—in bottles of 50 tablets, each tablet containing bile salts (sodium taurocholate and glycocholate), extract cascara sagrada, phenolphthalein, oleoresin capsicum.

DOSAGE: 1 tab. t.i.d.. or 2 tab. at bedtime.

Modified 'Veracolate' cholagogue-evacuant*—in bottles of 50 tablets, each tablet containing bile salts (sodium taurocholate and glycocholate), phenolphthalein, oleoresin capsicum, pepsin, pancreatin.

DOSAGE: 2 tablets 2 hrs. after meals.

*(*Recommended for adult use only)*


In Influenza
NUMOTIZINE
PROLONGED DECONGESTION AND ANALGESIA PROVIDED BY NUMOTIZINE ELIMINATES NEED FOR CONSTANT ATTENTION. VALUABLE ADJUNCT TO SULFONAMIDE THERAPY.
NUMOTIZINE, INC., 900 N. FRANKLIN ST., CHICAGO, ILL., U.S.A.

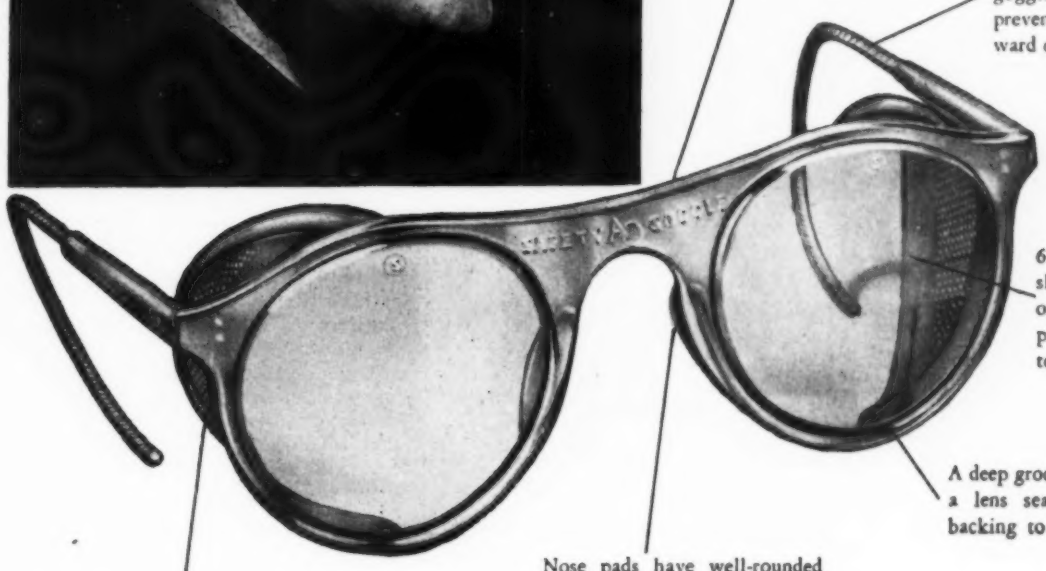
President espouses at the moment. The moment Mr. Truman plumped for unification of the services, Secretary Forrestal gagged naval officers who were opposing it. Mr. Forrestal did have the grace to exempt testimony before congressional committees. Dr. Parran's gag was absolute. By the terms of his instructions, any public health employee who appears before congress must, whatever his personal views, indorse socialized medicine. Mr. Truman, of course, has a long series of vicious precedents for his action, established by his predecessor. Early in the Roosevelt administration it became a common practice to compel long established government scientific and statistical agencies with high reputations for honesty and accuracy to doctor or suppress their reports to substantiate the theories of Tugwell, Wallace, the public housers, and other New Deal star gazers. The millions of public employees of the United States are the employees of the public, not the personal servants of the President. It is the public which pays for their services. When they are specialists in a particular field, the public is entitled to impartial statements of their expert knowledge on matters of public policy. To prostitute them into drum beaters for White House policies, which have not even had the consent of congress, is an imposition not alone upon congress but upon all the people of the country.

—Editorial, *Chicago Tribune.*

What Is Being Done

EXAMPLES of what disabled veterans may expect in the way of cooperation from industry: A pump and farm machinery manufacturing concern in Batavia, Illinois, has purchased a 23-acre park along the Fox River, which it has converted into living quarters and a rehabilitation center for servicemen who wish to enter the employ of the company. In addition, the management has instituted a special training program providing instruction in all branches of the company's manufacturing, servicing and sales departments. Scholarships are being awarded in nearby colleges and universities for ex-service employees who wish to continue their academic education. The G. I. Camp is equipped with a cafeteria, barracks, library, game rooms, swimming pool, outdoor sports facilities, and in general resembles a typical section of an Army Camp. An electrical equipment factory in Detroit, with a successful record of employing disabled workers is now in the process of re-hiring medically limited and handicapped war veterans, along with able-bodied men. Their methods of adjusting the applicant to the right job are reflected in an experience with a former employee following his return to work after heavy combat duty in the Pacific. Suffering from a form of war neurosis, this man was placed in his former occupation as a welder. Soon, however, it was found that the arc of the welding torch produced a condition similar to ordeals that he had undergone while fighting and thus aggravated his mental condition. After studying his case with medical aid, company officials induced him to change to a quieter and less trying job at which he has since proved successful. A similar experience was had by a re-employed veteran in a New England plant. Owing to the lack of a specific plan for studying the individual cases of returning servicemen, this man was placed in a job at which he was exposed to the same type of noise and vibration that had caused his medical discharge from the Army. As a result, he lost a hand in the operation of a large power press. Following the accident, the plant management began making special medical provision for discharged applicants. Benefiting by this one mistake, the company is now enjoying complete success with its postwar employment program. A company in Philadelphia carries a staff of 300 disabled workers as a regular feature of its present and future labor program. Realizing that many of this staff will come from the ranks of ex-servicemen, the company has employed as a member of its personnel department, an Army Captain whose background in service was especially suitable to handling disabled workers both with regard to their selection and training and to their relations with the management and fellow employees. Considerable thought is being given to jobs in each department of a silverware company in Connecticut that can be handled by disabled men. Impaired servicemen are being given every opportunity to find suitable

6 FEATURES make AO FUL-VUE ACETATE GOGGLES..... SAFE, COMFORTABLE, ATTRACTIVE



Stronger, more sturdy front than on ordinary acetate frames. Bridge has a slight amount of face form to give added side protection.

Comfort cable temples hold goggles snugly in position—prevent them from sliding forward on nose.

6-curve Super Armorplate lenses shaped to conform to and cover orbit of eye, provide maximum protection and vision, plus better appearance.

A deep groove in lens rim forms a lens seat with substantial backing to resist *severe* impact.

Nose pads have well-rounded edges and ample flare to withstand ordinary jolts and blows.

Acetate side shields protect against particles striking from sides. Perforated to provide ventilation and help keep lenses from fogging.

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IN *Coryza*

BY "reinforcing" the muco-ciliary defense with *Pineoleum* in the first stage of coryza, secondary invasion by bacteria may often be mitigated. *Pineoleum* provides a soothing film of liquid petrolatum which aids in correcting dryness, removing incrustations and thus promoting ciliary activity. At the same time, it reduces congestion by gently shrinking the swollen turbinates—and its action outlasts that of aqueous sprays.

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FORMULA: 'Pineoleum' contains camphor (.50%), menthol (.50%), eucalyptus oil (.56%), pine needle oil (1.00%), and cassia oil (.07%) in a base of doubly-refined liquid petrolatum—plain or with ephedrine (.50%).

PINEOLEUM
(Reg. U. S. Pat. Off.)
PLAIN OR WITH EPHEDRINE

PROTECTS *WHILE IT RELIEVES*

employment with this company. In one instance a part-time job was created for an Army Captain who returned from the Pacific with an impairment that permits him to work only a few hours daily. The guiding hand of the company's Veteran's employment department is a former Army personnel classification officer who saw combat service in Europe, and is considered proficient at assisting ex-servicemen with their problems of civilian readjustment. The primary objective of his efforts is to place applicants in work they desire and can do best. Walking through a North Adams, Massachusetts, radio parts factory, the visitor may observe workers with various physical handicaps performing their duties with absorbed precision. At one point during wartime production this factory had a payroll of more than 450 handicapped employees. The plant personnel manager firmly believes that the disabled are on a fully equal basis with other workers if they are permitted to select their own jobs. This is one of the company's guiding principles in a program designed to hire varying numbers of disabled servicemen. In the past disabled workers have made up an important part of the payroll of a small manufacturing concern in New York City, employing less than 500 men. Some of those employed during the war are now gone, owing to union seniority rules and replacements. Those still on the payroll, however, include an ex-soldier who lost a leg in Army maneuvers, a blind employee, and an ex-soldier who suffers occasional mental "black-outs" due to "shell shock."

—American Mutual Liability Insurance Company, Release.

The Winder Clinic

EVERYTHING from hay fever to high blood pressure, from hiccups to having a baby—that's a cross-section of the occupational and non-occupational diseases that confront MISS EUNICE CHAPMAN when she makes her morning rounds of six factories at Winder, Georgia. MISS CHAPMAN is the nurse in charge of the only cooperative clinic in Georgia—possibly the only such clinic in the United States—the Manufacturers Health Clinic, with headquarters in the bank at Winder. Two years ago . . . . four clothing and two furniture manufacturers decided that an effort to maintain the health of their employees would pay off in time saved and absenteeism lessened. Most of the doctors had gone to the Army or Navy, and those left were so overworked that a patient would lose two or three days from work just sitting in a doctor's office waiting to get to see him—frequently about some minor thing that could have been handled by a qualified nurse who could screen out the cases that really needed a doctor's immediate attention. None of these six manufacturing firms was large enough to afford a full-time nurse for the individual plant; but together it was easy. Sharing the cost six ways, it is no hardship on any one of them. Altogether it cost less than $1,000 for the initial equipment of the clinic and now it takes 20 cents a month per employee to maintain it, the total operating expense being about $275 a month. And it's worth every bit of it, the officers of the organization, who are also heads of the plants, are certain. In her clinic in the bank, MISS CHAPMAN examines every prospective employee of any one of the factories. Besides a routine physical examination, she gives them a blood test, shots for typhoid and vaccination for smallpox. She tests their hearing and their eyes. "If a woman can't thread a needle except by the touch system, she's not much good at a power machine until she gets glasses," says the nurse, referring the employee to an eye doctor. She examines their teeth and sends them to a dentist for needed work. If there is any reason to suspect tuberculosis, she tests them for that, too. And frequently a mother will bring the baby along and ask advice about its formula, or a father will ask MISS CHAPMAN to take a look at his little girl and see what makes her so pale all the time. At first the factory people were a little suspicious of the innovation. But when they found out it was all free, and after a few accidents noted that it was mighty good to have a nurse to call on in an emergency, the employees welcomed MISS CHAPMAN. Now when she comes into the factory, they call "hey" to her like the friends they are. In each plant, the nurse and the owner have fixed

Multiple Vitamin Supplementation

LOGICAL, ECONOMICAL PRODUCT FOR A LOGICAL NEED

EACH CAPSULE CONTAINS:	
Vitamin A	5000 U.S.P. units
Vitamin D	800 U.S.P. units
Thiamine Hydrochloride, U.S.P.	3 mg.
Riboflavin	3 mg.
Ascorbic Acid, U.S.P.	75 mg.
Nicotinamide	20 mg.
Pyridoxine Hydrochloride	0.5 mg.
Calcium Pantothenate	5 mg.
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offer a preparation formulated upon a sound therapeutic basis—realistic efficiency—practical usefulness—and *economy* to the patient.

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Small, easy-to-take capsules. Price to the patient is also small for comparable vitamin potency. The White name is assurance of stability and uniformity.

†**Indications:** Routine prophylaxis against dietary deficiencies—increased metabolic rate—thyroid dysfunction; suspected border-line multiple deficiencies; suboptimal nutrition—restricted diets—the aged—wasting disease—pre- and post-operatively—in convalescence—pregnancy—lactation.

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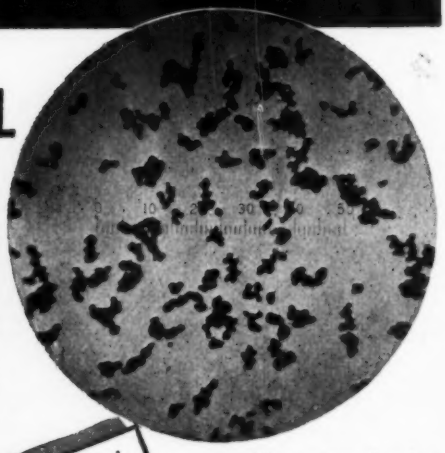

Illustration showing flowers of sulfur magnified 82X: small divisions = 10 microns. The size of the colloidal sulfur particle in Hydrosulphosol is estimated at 1/1000 of a micron or 1/10,000 of the small division particle illustrated

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Its therapeutic importance may best be evaluated by the fact that the —SH radical of the cysteine forms the active group in glutathione, alone of reported importance in connection with tissue oxidations.

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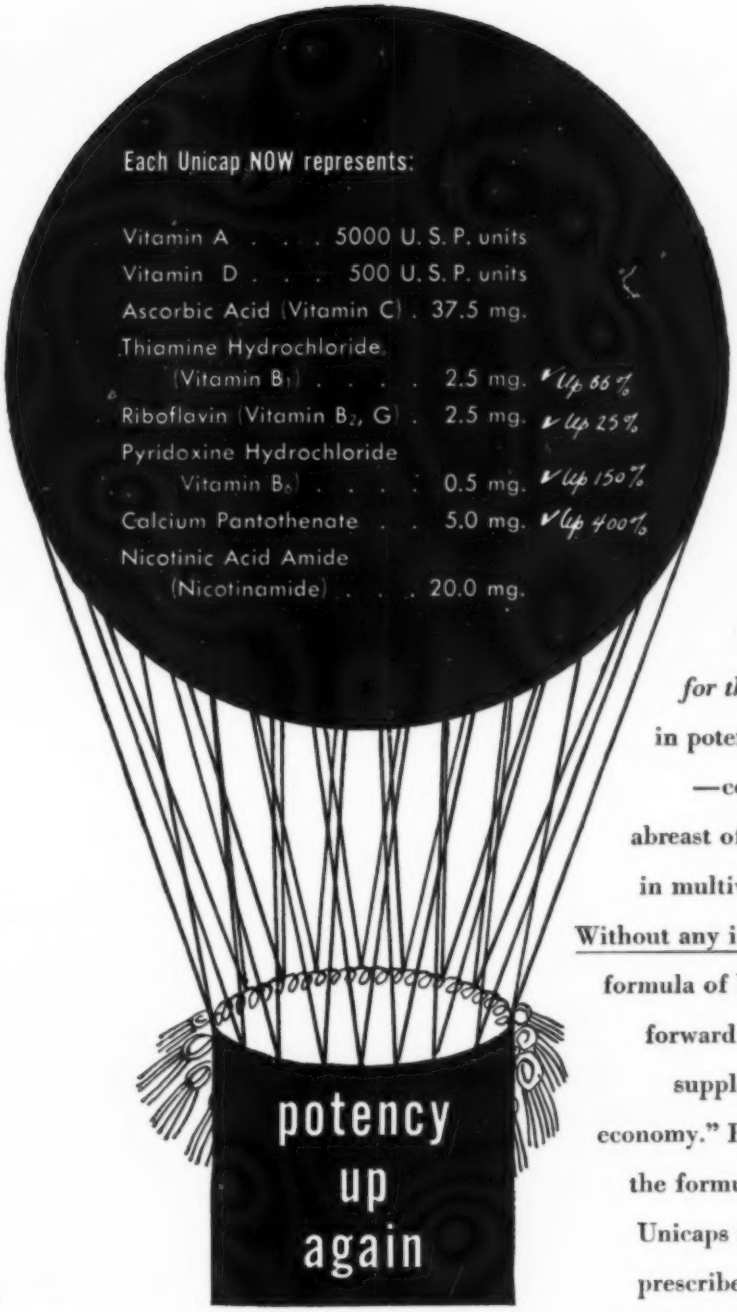
up a first-aid room—a neat little white oasis in the midst of the bustle and noise of a factory working at full reconversion speed. When she told them they would need such a room, with a bed as well as a cabinet for supplies, tables, chairs, record book, and the like, the owners were dubious. There just wasn't any extra space. But when they discovered that the nurse, like Oliver Herford's well-known wife, had a whim of iron, they built on a new space—right over the staircase, in one instance. And MISS CHAPMAN trained first-aid workers in all the factories; now she has 26 graduates who can take charge, in case of an accident, until she can be called. Her work is hardly ever dramatic or exciting, but once in a while there's a serious accident that her presence prevents from being really disastrous. When the plants were doing war work, they frequently had night shifts, and it was sure-enough impossible to get a doctor at night. MISS CHAPMAN had to give first aid and then call an ambulance to take the patient to the hospital in Athens. But most of the time her work is routine safety and prevention work looking after the hygiene and sanitation at the factories, giving simple remedies for minor troubles. She even had one stubborn case of hiccups, which eventually yielded to the soda-and-water cure. A clinic nurse has to be a social worker, too, because the people she deals with are likely to bring her all sorts of domestic problems, from whether to get a divorce or not, to what to do for a black eye you got on your honeymoon. There was one girl who couldn't talk—she had something like hysterical paralysis; and another was found to have a temperature of 103 and sent home with pneumonia. The Clinic has had 3,593 patients since it was started May 1, 1943. About 80% of the employees of the six factories are women; the nurse has plenty of "problems" as well as temperature-taking, to keep her busy. R. L. EAVENSON, chairman of the Clinic, says the whole program has proved to be a fine thing from both the employer's and employee's viewpoint. "It keeps 'em well and working," he points out. The Georgia State Health Department has cooperated with advice, as well as sending their mobile unit to x-ray everybody for tuberculosis; and DR. L. M. PETRIE, director of the Industrial Hygiene Service of the State Board, says, "I am very proud of this program, as I believe it is a working example of one of the best methods devised to date for meeting the health requirements of small industries. I am promoting similar cooperative organizations for other groups of small industries throughout the state." And he adds that the national attention focused upon the organization—the U. S. Chamber of Commerce was much interested—is evidence of the fact that the Manufacturers Health Clinic is doing an outstanding job.

—KATHERINE PIERCE, "Co-op Clinic," in *Atlanta Journal Magazine*, Atlanta, Georgia, December 9, 1945.

Abbott Laboratories Medical Care

THE insurance plan of Abbott Laboratories is thus described PHIL HANNA, in *Chicago Daily News*: "The hospitalization insurance plan now includes employee's dependents as well as the employee and the latter pays but a small part of the cost. Such insurance for the employee has been in effect for six years and has been paid for in full by the company. But recently Mr. Clough wanted to provide the same service with medical insurance for employees and their dependents as well. No insurance company had experience tables. Finally, the Equitable Life Assurance Society agreed to a trial program to give an employee's dependents the same care the employee gets, the employee paying $1.50 regardless of the number of dependents. The timetable of the inauguration of the various health helps at Abbott Laboratories tells the story admirably: *March, 1931*—Life insurance for employees. Company pays more than half the premium. *December, 1933*—Health and accident insurance for employees. Company pays 60%, employee 40% of the cost. *April, 1936*—Accidental death and dismemberment insurance for employees. Company pays the premium. *December, 1938*—Hospital and surgical care for employees. Company pays the cost. *June, 1939*—Hospital and surgical care for dependents of employees. Employee pays part. *March, 1945*—Medical care for employees. Company pays for it. *December 1, 1945*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—Medical care for dependents of employees. Company pays $2 a month, employee $1.50. "It is claimed that Abbott's is the only company in the world that provides the last two mentioned services. In addition the company has an established Christmas bonus plan of $5 a year for each year of service. The minimum bonus is $10 and the maximum is equal to one-half of one month of an employee's salary. The details of some of the services are also unique. The medical insurance plan provides for 50 visits a year by a physician or for calls at the physician's office. It also includes $25 in laboratory fees for cardiographs, urinalyses, blood tests and x-rays. There ars also provided free eye examinations, and now Mr. Clough is planning a dental program. An employee who subscribes to the full health program pays no more than $60 a year. This compares with the maximum cost of $144 a year in the Truman health plan 'for lesser coverage.'" *Equitable Agency Items*, December 17, 1945, noted as follows: "When Abbott Laboratories became the first organization to provide group medical expense insurance for dependents of its employees, it likewise was the first to adopt every form of group protection available to employees and dependents. An almost unanimous desire for this latest group coverage was registered when 99.4% of 1,150 eligible Abbott employees subscribed for the protection for the benefit of their dependents." The plan provides that "only licensed M.D.s render care."

Bristol-Myers Benefit Plan

BRISTOL-MYERS Company has adopted a broad program of employee benefits to ease hardship resulting from illness, disability of long or short duration, unemployment and death. Embodied in the plan is a comprehensive schedule of medical benefits, covering expense of hospitalization, physicians care, including surgical treatment, nursing services, laboratory and x-ray examinations. The plan involves no cost to employees, the company assuming the entire expense of its operation. In the words of HENRY P. BRISTOL, president: "For many years, the company has made available to its people group insurance covering life, sickness and accident, and hospitalization as well as a pension plan. The life insurance was free to all regular employees; the pension plan was paid for in part by the individual employees and the balance by the company; the accident and hospitalization insurance was paid for entirely by the employees. Frankly, we did not feel that the protection was as adequate as we would like. We studied many plans offered by insurance companies and none seemed broad enough. Therefore, it was decided to write our own program and then secure an insurance company to underwrite as much of it as possible. Groups of our own employees made excellent suggestions and they also rendered helpful assistance. Occidental Life Insurance Company of California agreed to underwrite certain parts of the plan. The pension plan, underwritten by the Aetna Life Insurance Company, continues in effect as before." An outline of the benefits provided by the plan follows:

For sickness or accident resulting in short term loss of income—Regular salary (exclusive of overtime) for a maximum of six weeks during any one period of disability which results in time lost from work. Three months of active service with the company establishes eligibility for these benefits.

Long term disability — Benefits commence at the end of the sixth week of disability, at 50% of regular compensation within these limits: less than one year of service, none; one year of service, five weeks; two years, 10 weeks; three years, 15 weeks; four years, 20 weeks; five years, 25 weeks, with graduated increases on this scale to 100 weeks for 20 or more years of service.

Permanent total disability—After 10 years of service benefits start at 20% of regular compensation ranging upward to 50% of compensation for 25 years of service, payable up to retirement age of 65. (Since the plan makes no distinction between non-occupational and occupational disabilities benefit payments will be adjusted for any loss of time benefits recoverable under Workmen's Compensation Insurance.)

Reimbursement for cost of medical care will be available to employees after three month's service under the following schedule: For any one disability, semi-private hospital accommodations at a cost not to exceed $420; hospital service

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Prescribe 'B•F•I' Antiseptic First-Aid Dressing and Surgical Powder . . . an efficient, antiseptic, dry, surgical dressing with protective, astringent, absorbent and soothing qualities . . . for the treatment of cuts, burns, abrasions, chafing, scratches and other minor wounds and skin irritations . . . also effective in the treatment of epidermophytosis (athlete's foot).

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★ Therapeutically, Ertron is unique in its antiarthritic activity. Many patients in large series of clinical studies have experienced restoration of movement in affected joints, relief of pain and measurable evidence of reduced swelling.

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Simply stated, Ertron is electrically activated vaporized ergosterol prepared by the Whittier Process.

Ertron contains a number of hitherto unrecognized factors which are members of the steroid group. The isolation and identification of these substances in pure chemical form further establishes the chemical as well as the therapeutic uniqueness of Ertron.

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charges, $100; surgical attention, $225; physician's care at $5 per hospital or home visit and $3 per office visit; laboratory and x-ray examination $25; nursing services, $300. Benefits for physician's visits and laboratory and x-ray examinations and nursing services are subject to a $50 deduction.

Employee dependents are insurable under the medical benefits section at a monthly premium cost of $3.50 for one dependent and $5 per month for two or more.

Life insurance coverage for employees ranges from $1,000 to $15,000 or approximately equal to regular salary.

If the company discontinues either temporarily or permanently the services of a regular full-time employee because of lack of work, he would be entitled to 50% of regular salary for periods ranging from four weeks for six months of service to 50 weeks for 10 or more years of service with minimum benefit $20 per week and maximum $100 per week, subject to adjustment for unemployment benefits under state unemployment insurance acts.

No medical benefits of any kind are provided for: (1) Any disability which is not treated or cared for by a licensed doctor of medicine. ("'Licensed doctor of medicine'—means a person licensed to practice and actively practicing medicine or osteopathy in the state in which he resides. 'Nurse'—means a registered or graduate nurse.") (2) Dental services of any kind. (3) Any expense incurred, during any calendar year, in excess of the following: employee alone insured, $1,500.00; employee and one dependent insured, $2,000.00; employee and two or more dependents insured, $2,500.00. (4) Pregnancy of an employee, until she has been continuously insured for a period of six months. (5) Insanity of a dependent. (6) Self-inflicted injuries while sane or insane. No benefits for physicians' visits, examinations, or nursing service are provided for: (1) pre-marital examinations; (2) pregnancy or childbirth or complications therefrom; (3) any treatment or services rendered more than three months after discontinuance of the employee's insurance. No benefits for physician's visits are provided for any visits made at the time of any surgical operation or during convalescence therefrom if payment is made for such operation in accordance with the "Surgical Operations" item of the plan.

—From "Insurance and Protection Plans for Employees of Bristol-Myers Company."

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Desitin Ointment contains Cod-Liver Oil, Zinc Oxide, Petrolatum, Lanum and Talcum. The Cod-Liver Oil, subjected to a special treatment which produces *stabilization* of the Vitamins A and D and of the unsaturated fatty acids, forms the active constituent of the Desitin Preparations. The first among cod-liver oil products to possess unlimited keeping qualities, Desitin, in its various combinations, has rapidly gained prominence in all parts of the globe.

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Indications: Minor Burns, Exanthema, Dermatitis, Care of Infants, Care of the Feet, Massage and Sport purposes.

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British Studies of Sickness

RELATION of many significant factors of work and living to absenteeism due to sickness, among British women industrial workers, is explored in two publications issued recently by the Industrial Health Research Board of the British Medical Research Council. Based on a study of 500 women workers in four representative factories, extending through the first six months of 1943, the reports summarize the results of interviews inquiring into all factors relevant to the health or sickness of these workers. As background for the information obtained directly from the women, the sickness absenteeism records of the factories were analyzed. Sickness was found to account for absence causing a loss of 7.8% of the total working time. Two-thirds of the sickness absence was caused by only 16% of the working force. Illnesses causing most lost time were the respiratory, "nervous" and "fatigue," and digestive diseases. Young, married women were responsible for most of the absences, especially from "nervous" and digestive diseases. Older married women lost less time than older single women. Workers on the shift schedule changing weekly from day to afternoon to night work were particularly liable to sickness absence. From the interviews, it was learned that two-thirds of the women workers either definitely disliked or merely tolerated the weekly shift changes. Night work was blamed for digestive disturbances and inability to obtain enough sleep, as well as disturbances of family life which created nervous strain leading to absence. Lack of proper week-end break made many workers tired, bored, and discontented. About half the women had personal worries, due either to the war or to excessive household cares, and worry was associated with a high rate of sickness absence according to these two publications.

—*Industrial Hygiene News Letter*, January, 1946.

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Assistant Professor of Medicine, College of Physicians and Surgeons, Columbia University; Associate Attending Physician, Presbyterian Hospital and Vanderbilt Clinic, New York

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This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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The Journal of Industrial Health, Occupational Medicine and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 15 | February, 1946 | Number 2

A Brief Personality Appraisal Technique

—For Use in Interviewing—

LEONARD E. HIMLER, M.D.,
Ann Arbor, Michigan

WHETHER or not it is always consciously realized, the course and outcome of many interviews depends less on the actual facts discussed or considered than on the skill and accuracy with which personality factors are appraised and handled. In most business and industrial contacts there is seldom opportunity to make extensive investigations of the background and personality of an individual in advance of an interview. For this as well as other obvious reasons it becomes desirable to cultivate to the greatest possible degree the faculty of skillfully and accurately appraising all factors bearing on personality and motivation which are revealed as the interview progresses. If it is to be useful in industrial personnel work, any technique devised to meet this need must of course not presuppose an extensive knowledge of psychology or psychiatry.

It goes without saying that interviewers should take active interest in a practical method of appraising individuals which can be applied in a more or less standardized way during employment and counseling contacts. This involves first of all an ability to form reasonably correct first impressions. It also requires flexibility and an alertness to all actions and responses which substantiate, contradict, or call for modification of the original impression. If it is to be really valid, the personality appraisal must assay to the highest possible degree the full potentialities of a person as he stands, and at the same time it must take into account the significant trends evident from whatever biographical material is available concerning his past life and experiences. A complete case history in the clinical sense is neither possible nor necessary for ordinary interviews or counseling sessions, but it should be obvious that some familiarity with the case history method constitutes an essential part of any appraisal procedure.

While the science and art of appraising human personality is admittedly a mental exercise demanding a high degree of skill and mature judgment, its effectiveness in any instance can be increased if the survey is made according to an orderly plan, and if judgments are sharpened with the aid of certain qualitative and quantitative yardsticks which measure basic personality characteristics and functions. The interviewer's aim should be to develop a technique which systematically probes and evaluates each major area of personality function. The following schema is an attempt to present such an approach as it might be applied to employment and counseling interviews with employees in industry.

EVEN the most elementary approach to the study of personality must include consideration of physical, mental, and emotional facets. After the external and visible aspects of personality have been appraised, there remains the more difficult task of evaluating the hidden and intangible factors which determine the direction, motivation, and influencability of the individual in relation to his work. These can best be approached from the point of view of the traditional teaching in psychology, namely the three primary categories of thinking, feeling, and acting or behaving. Factors relating to emotion and behavior can further be considered in terms of immediate, visible responses to specific situations (of which the interview itself is one), and in terms of long-range tendencies which reflect the organized habits of the individual. For the purpose of a simplified industrial personality profile, long-range trends can be grouped under the headings of Temperament, Attitudes, Behavior, Organization, Maturity, and Character. The main topics to be considered in an interview appraisal can then be listed in the following order:

1. General appearance: manner, dress, poise, facial expression, conversation, and physique.
2. Intellectual resources, including specific skills, aptitudes, and abilities.
3. Emotional reactions.
4. Temperament and ego direction.
5. Attitudes toward self and health, other people, work, and authority.
6. Behavior tendencies, organization, maturity, and traits of character.

In applying this approach to the individual's industrial adjustment, these qualities must be considered as variables which can be differently and separately weighted. Some individuals, for instance, may rate high in external appearance and first impression, but low in emotional control, organization, and character. Many with strong intellect and highly developed skills have social attitudes which are likely to lead to job

TABLE I.
PHYSICAL CHARACTERISTICS

	Endomorphy	Mesomorphy	Ectomorphy
Appearance and Manner	Slow Relaxed Free and open Unhurried Comfortable	Bold Assertive Self-sufficient	Quiet Restrained Intent
Head, Face and Neck	Spherical head Wide face Smooth contours Short neck	Head cubical-shaped Thick, strong face Hard features Wide, solid neck	Narrow, long head and face Small, sharp features Long, thin neck
Facial Expression	Direct Amiable Lively	Frank Unafraid	Watchful Attentive Overly alert
Voice and Speech	Soft Deliberate	Outspoken Unrestrained Loud, sometimes boisterous	Reserved Inhibited Concise
Body Build	Roundness of physique Large-bodied Stocky, spherical Broad chest and abdomen Small bones Tend to become fat	Sturdy, rugged and hard Broad-shouldered Heavily muscled Low waist Strong-boned Become solid and heavy with age	Lean, slender, thin Narrow, drooping shoulders Flat chest and abdomen Deficient in fat and muscles Unable to gain weight
Extremities	Short-limbed Small hands and feet	Symmetrical, heavily muscled limbs Strong hands	Weak thighs and upper arms Delicate hands Long fingers

maladjustment. The quantitative value to ascribe to each personality characteristic may be estimated in a rough way by considering the four categories of (1) normal or average, (2) lacking or deficient, (3) strong or excessive, and (4) distorted or abnormal. In industry the great majority of employees will fall into the first three categories, since the extremely abnormal individuals are generally not difficult to identify and eliminate. Bearing on this point, however, it must be remembered that it is the questionable and borderline abnormals who cause the greatest number of personnel difficulties in industry, and these are by no means as readily "spotted" as the grossly abnormal or psychotic.

In the following sections each of the areas of the personality appraisal as given in the above outline will be considered in further detail.

1. General Appearance

THE first and most readily accessible part of an individual's personality, as has been mentioned, is his external appearance. This includes manner, dress, poise, facial expression, voice, conversation, and body build or physique. The interviewer needs always to be mindful of the danger of attributing too much importance to superficial aspects of personality as gained from a favorable first impression. The pattern revealed by the combined total of all the characteristics should always be weighted more heavily than any single trait, however desirable or undesirable it may appear to be.

One aspect of an individual's external appearance which is of particular interest is his physical build. It has always been known that certain personality qualities tend to be associated with certain body types, as illustrated by the common observation that fat people tend to be extroverts, and tall, thin people tend to be introverts. This subject has recently been the object of a thorough medical and psychological investigation by Dr. Sheldon, of Harvard University, and some of the conclusions given in his publications[1] have definite value for industrial physicians and personnel interviewers. According to Dr. Sheldon's view, the physical constitution of each individual is derived from different degrees of development of the three primary embryonic germ layers, and from these the terms endomorph, mesomorph, and ectomorph are derived. Some 76 main types of body build can be differentiated when a graduated seven-point scale is applied to each of these basic physiques. The more outstanding physical characteristics found in individuals possessing a high degree of endomorphy, mesomorphy, and ectomorphy, respectively, are presented in simplified form in Table 1.

While this classification gives a convenient framework for appraising the physical basis of personality, in most normal or average individuals these three components are combined and blended so evenly and harmoniously that it is not always possible to determine the predominant type on first glance. But when the predominant physical type can be recognized, either by trained observation or anthropometric studies, then a high degree of correlation with typical qualities of temperament can be expected. Dr. Sheldon has given the three main types of temperament the names viscerotonia, somatotonia, and cerebrotonia, indicating predominant development of the visceral, muscular, and cerebral components of personality. In Table 2 the qualities of personality found in each of Sheldon's types are correlated with the previously outlined functional areas to be investigated in the interview appraisal. As might be inferred, each of these predominant types, in addition to personality differences, tends also to have different vocational predilections and interests. The board direction of these and their implications for placement in industry are presented briefly in the last item of the table.

2. Intellectual Resources

OF THE non-visible aspects of personality, the intellectual endowment is apt to be the first which is revealed in its true perspective during contacts between individuals. This is ordinarily best judged by the interviewee's speech and writing, the quality of his responses to questions, the speed, accuracy, and appropriateness of his thoughts, his fund of general knowledge, his arithmetical ability, together with the special information he possesses in connection with his type of work, and the manner in which his abilities have been and are being put to use.

For practical purposes, the intelligence level, the skill, dexterity, and special aptitudes possessed by an individual may be considered the most static part of his personality. As is well known, these lend them-

TABLE 2.
PERSONALITY CHARACTERISTICS

	Viscerotonia	Somatotonia	Cerebrotonia
Intellectual Resources	Practical Realistic Slow thinking	Dominated by drive to be active and overcome obstacles Disinclination to study	Logical Analytical Studious Philosophic Creative
Emotional Reactions	Complacement Genial Easygoing Friendly Responsive	Tough, callous Vigorous Liberty loving Independent Insensitive	Repressed Tense Overly sensitive
Temperament and Ego Direction	Extraverted Tolerant Human, warm Phlegmatic	Assertive Energetic Egotistic Lust for power and speed	Introverted Idealistic Self-controlled Judicial
Attitudes	Sincere, cheerful Tolerant, kind Builds good-will Lives close to Mother Earth	Courageous, competitive Adventurous Likes power, risk Lives for present	Cautious, serious Sharply attentive Lives for future
Behavior Tendencies	Fond of company and affection Fond of comfort Fond of eating and drinking Not athletically inclined	Aggressive Prefers change, not routine Strong interest in athletics and sports Does not require much sleep	Socially shy Likes privacy Prefers to work alone Little interest in physical activity Tires easily but recovers fast
Vocational Interests	Work requiring deliberation and executive ability, handling of people, interest in the material good things of life, but not requiring hardships or labor.	Work requiring physical stamina and strength, travel and endurance, not work requiring close confinement indoors.	Work requiring thought, reasoning, judgment, abstract knowledge, creative ability and inventiveness, but not requiring extensive physical strenght or endurance.

selves to quantitative appraisals through the use of psychological tests. While such tests can determine with greater accuracy than the interview what the true limits of an individual's abilities are, it should be remembered that they cannot by the same token establish or predict what the individual will do with his innate capacities under all the conditions of his employment. The interview contact still remains the best instrument for gauging strength of purpose, motivation, capacity for cooperation, loyalty, and dependability, regardless of the test results.

Even without the aid of tests, it is entirely possible through the skilled interview to determine with considerable reliability the general intelligence level on which the individual functions, ranging from deficient, borderline, and average, to above average and superior levels. In this connection, a rough estimate of the I. Q. can also be made by relating the highest school grade passed to the age at which the individual left school.[2] Judged by reactions observed during the interview, it may be possible to further qualify the intelligence and aptitude by such terms as alert, dull, inadequate, logical, practical, quick, in good or poor touch with reality, retarded, slow, stupid, well-informed, etc. The incorporation of one or two of such descriptive terms into the record of the interview is often very helpful, with full realization, of course, that impressions of this kind may require modification as a result of further investigation.

3. Emotional Reactions

ALTHOUGH it is admittedly complex and constantly changing, the emotional life of an individual is manifested at least in part by the feelings and responses he shows in handling his immediate situation. With respect to his industrial relationships, this may be an employment application, a counseling session, a grievance presentation, a personality clash, or a job adjustment discussion. Industrial physicians are well aware of the fact that characteristic emotional responses often are revealed during a medical examination or in the course of treatment of some physical condition. This is even more true in the case of employees who make repeated visits to the first aid station for minor or trivial disorders.

While an isolated report of an undue emotional response has only limited value and may even be misleading, if a definite trend appears from accumulated experience with an individual, it may throw considerable light on his job relationships, and it thus becomes more and more important as a predictive factor. It is well known that the effectiveness of any interview hinges largely on the emotional tone which prevails, and it is at this point that the interviewer must be reminded that his own personality, attitudes, or prejudices cannot be divorced from the interviewing or counseling process.

In his effort to keep in tune with the emotional undertones and overtones which develop during the course of an interview, the counselor's judgment is materially aided if he has access through his vocabulary to the proper descriptive terms. The following short list includes some of the more common emotional responses which may be observed during the interview: anxious, depressed, excitable, fearful, inhibited, insecure, irritable, over-sensitive, possessed of "inferiority complex," self-confident, self-conscious, suspicious, tensional, touchy, unresponsive, unstable, withdrawn, worrisome.

4. Temperament and Ego Direction

THE term temperament refers to the characteristic, deeply-seated, and more permanent emotional dispositions of the individual, from which the more specific expressions of feeling at any given moment have their origin. The long-range emotional drives and moods which express the striving of the ego or self are not always revealed during a single interview, but they may be reflected in certain portions of the interviewee's spontaneous account of his life attitudes, interests, ambitions and goals. Unfortunately there are no psychological tests which can give reliable or at all conclusive information on this area of personality function, although efforts in this direction are constantly being made. Until such time as more accurate tests are devised, this subject remains one which offers its greatest challenges to the skilled interviewer.

As has been mentioned, the work of Sheldon should be of considerable assistance in establishing guide-

lines for the study of temperament, and the interviewer should always be keenly alert to the degree of correlation which can be determined between personality traits and the individual's physical type. The interviewer's skill in weighing and understanding qualities of temperament is intimately linked with his ability to select and apply accurate and properly descriptive terms to what he observes. For this reason his vocabulary must be broad and flexible enough to make possible the labeling of temperament traits as they are revealed during the interview. In addition to the terms listed in Table 2, the following are examples of descriptive adjectives which are frequently used in constructing a word-picture of this important part of the interviewee's personality: calm, changeable in mood, conscientious, egotistic, even-tempered, extroverted, good-natured, introverted, quarrelsome, quiet, phlegmatic, sociable, soft-hearted, shut-in, tolerant, unsettled, willful.

5. Attitudes

ATTITUDES revealed during the course of an interview may throw much light on the emotional responses and behavior expectable on the job. In the industrial setting the attitudes which are most important for adjustment are those shown toward one's self, health, other people, work, and authority. As in studying other aspects of personality, it should be remembered that attitudes shown toward life situations of a similar kind in the past are the best guides in estimating the future productivity of an individual. These are much more reliable than promises or the appearance of having good intentions, however sincere and earnest these may seem to be at the moment. The interviewer should take care not to mistake responses based on what the individual believes is expected of him for the true attitudes which are displayed when he is not so obviously "on his best behavior."

Skill in the use of the non-directive interviewing method is decidedly helpful in uncovering the real personality patterns and attitudes which habitually occur, and which the individual will reveal on his job. Attitudes shown toward supervision, and how well an individual interprets his relationships with others in a cooperative enterprise are often more important determinants of successful adjustment than possession of high intellectual qualifications and experience alone.

Examples of terms describing types of attitudes to be looked for during interviews are as follows: aggressive, ambitious (in relation to capacity to perform), cautious, complaining, confident, cooperative, critical, defensive, defiant, dependent, frank, insecure, interested, loyal, opinionated, passive, rigid, sincere, self-protective, submissive, resentful, stubborn, timid, uncertain, unsocial.

6. Behavior Tendencies

ALONG with an insight into emotional reactions, temperament, and attitudes, the interviewer must also constantly attempt to evaluate the type of motivation which is revealed in the long-section survey of the individual's occupational behavior, both in the remote and in the more recent past. Occasionally it is important to pay especial attention to certain past performances which the individual glosses over or minimizes. The behavior appraisal is concerned not only with strength of purpose or will, but with the organization, balance, and maturity which the individual tends to reveal in all his efforts. The interviewer should seek to determine the degree to which the individual is primarily self-centered, and to appraise his capacity to enter into constructive and cooperative enterprise with others, both on his own level and in relation to those who exert authority over him.

Although it may be of secondary importance, the study of behavior tendencies should include an impression of the amount of energy which is habitually diverted into social and recreational outlets, and if such trends are excessive, as in overuse of alcohol. It is only when behavior is seen in relation to the perspective and meaning which emotional under-currents give to it that the interviewer can approach a true appreciation of what is summarized by the term character, the most intangible and elusive of all the aspects of personality. It is unfortunate that many personnel workers are naive enough to attempt to appraise character purely from superficial aspects such as neatness in dress, a polite manner, an attractive appearance, or "an honest face."

Some of the terms which are helpful in describing behavior, organization, maturity, and character traits, are as follows: adequate, accident-prone, balanced, careless, conservative, dependable, disorganized, effective, energetic, eccentric, erratic, hostile, immature, industrious, maladjusted, over-aggressive, pushful, reliable, responsible, self-reliant, self-willed, stable, submissive, undisciplined, weak.

Comments

WHILE it is obviously not possible to make more than a rapid, streamlined personality inventory during the course of the average interview, some sort of appraisal nevertheless becomes an unconscious part of every really significant inter-personal relationship. Medical and personnel interviewers especially are in need of practical techniques which make this appraisal more objective and scientifically valid than is possible by merely following out half-felt, intuitive convictions and poorly analyzed hunches. An outline such as the above gives the interviewer a basis for breaking down his impressions into their component parts. It also provides a framework upon which a personality balance sheet can be constructed, without omitting any of the major aspects of the interviewee's functions which bear directly or indirectly on his occupational adjustment.

As has been indicated, industrial interviewers need to develop skill in selecting those terms which give both concise and accurate descriptions of presonality qualities. It is not sufficiently recognized that it is entirely possible to do this without the use of a great many technical words. The need, as in composing a telegram, is more for a precise than an extensive vocabulary. The task is not an easy one, and interviewers must be on guard against the danger of oversimplification by leaning too heavily on a few hackneyed or redundant expressions. The final appraisal, expressed as it were in a "personality telegram," with the greatest economy of words, must summarize both the assets and liabilities which have predictive value for vocational adjustment and success.

The importance of the personality factor and its appraisal is made evident by the frequency with which this aspect takes precedence over medical findings, work experience, education, and social background, in determining placement, transfer, or promotion. Essential as the personality appraisal is, interviewers should not lose sight of the fact that it is only one of a great number of considerations entering into employment and counseling relationships. It is only when all of these considerations are placed in their true perspective and given their proper weight that personnel interviewers can claim to be using scientific methods in employment screening and job counseling. This

applies not only to contacts with normal, average workers, but even more significantly to all personnel procedures involving employees with varying degrees of physical, mental, or emotional handicaps.

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Dermatitis Control

J. T. GRESH, B.SC. ENG.,
Safety Engineer and Director of Safety,
and
G. H. JACKSON, M.B. (TORONTO),
Medical Director,
Elastic Stop Nut Corporation of America

DERMATITIS or industrial skin disease now comprises approximately 70% of all occupational diseases. Estimates by leading authorities on the subject indicate that the average loss of a workman's time due to this skin affection is 10 weeks, with a compensation cost of $150.00 and a medical cost of $100.00.

Studies made by the U. S. Public Health Service with 100,000 workers found that 1% were affected by skin lesions resulting from contact, this figure being exclusive of all types of burns.

Dermatitis in the broad sense of the word is not new, and we do not contend that the control measures as outlined herein are altogether new. However, we feel that in view of the emphasis that has been placed on protective cream as a preventive, that a viewpoint on the other control factor, namely personal hygiene, is warranted.

In making this study on the control of dermatosis, the idea of protective cream was not abandoned completely, but the effectiveness, by comparison, of the protective cream and cleansing agents used under the category of personal hygiene were accurately recorded. Therefore, the scope of this report will be largely limited to the studies that were made to control dermatitis in our plants through the use of special cleansing agents.

The authors approached this study with the idea of effecting control measures for the costly cases of dermatosis.

Industrial dermatitis, which is the acute or inflammatory stage of occupational skin disease, has increased greatly in the past few years both from a frequency and severity standpoint among individual case studies. Furthermore, this has come about despite the greatly improved safety measures and hygienic programs. This increase is supposedly owing to the new and substitute materials brought into use as a result of the war, but in the opinion of the authors, this increase is due factually to the lack of personal hygiene and hygienic facilities surrounding the person affected.

Industry has long been aware of and recognized the hazard of industrial dermatitis and the necessity for safe-guarding the worker against certain obvious irritants. With this in mind, dermatologists now agree that almost any substance can, under the right conditions, cause dermatitis, a condition which can be serious and costly not only to the worker, but to management as well, because of the lost production involved.

There are two types of dermatitis involving industrial workers which are recognized by dermatologists, namely: (1) Inflammation of the skin owing to definite primary irritants such as acids, alkalis, cleaners, soaps, etc., in persons not allergic to skin rashes; and (2) sensitization dermatitis in which a specific cutaneous (skin) sensitivity is the underlying factor.

In limiting our study of dermatitis to those cases resulting from exposure to irritants in our plant, it is not difficult to point our finger at the source being the cutting oil used in our machines for manufacturing our product. This is, "dermatitis due to cutting oils."

Several theories can be advanced as to the causes of oil dermatitis: (1) That the fine sharp metal particles in the cutting oils cause minute cuts and abrasions to the skin which lead to the development of a rash; (2) that infection is one of the chief factors, and that germs are passed on in the oil from one man to another; (3) that dermatitis results from the blocking of the minute orifices in the skin, the glands, and the hair follicles, with dirt and grease. By this blocking, the body secretions through the sebaceous glands are held back, accumulated, harden, and eventually cause sufficient irritation to produce dermatitis; and (4) that fine chips and slivers of steel and other metals find themselves into the wiping rags used by the operators, and consequently, use of these rags causes small lacerations to the skin. Despite laundering services, these chips and slivers are not completely removed. These minute lacerations become infected if not properly cleansed.

Realizing the importance and value of each of these theories, steps were taken to eliminate the hazard through adoption of mechanical means to carry out the theory.

Referring to theory (1)—that sharp metal particles in the cutting oils cause minute cuts and abrasions to the skin which lead to the development of a rash)—a centrifugal pressure extractor was placed in service whereby all oil removed from the machines would be stored in a large vat, this oil being pumped through the centrifugal extractor wherein all minute metal particles would be screened out and forced to the outside of the extractor, allowing the clean oil to pass through into clean containers. Microscopic analysis revealed that the greater percentage of these minute metal particles were removed, thereby eliminating the possibility of these fine particles in the cutting oils causing abrasions and cuts which would lead to a rash. Despite this mechanical adaptation of the first theory, cases of oil dermatitis continued to arise and exist.

Taking resort to theory (2) in which infection is a chief factor (these infectious germs being carried by the oil from one operator to another), a sterilizing unit was incorporated in our oil reclaiming process. As a result of this installation, we were now able to return the oil from the machines to a central storage vat from which the used oil would pass through the centrifugal extractor removing whatever fine metal particles were contained therein as a result of machining operations, and from this point being passed into a sterilizing unit where the oil would be heated to approximately 192°F and held at this temperature for the sterilization period of time. Sterilization as used in this respect means the application of a given amount of heat for a given period of time which in turn inhibits the growth of germs or bacteria. From this operation it would be piped back to the machines for reuse. In spite of the foregoing preventive measures, the mechanical adaptation of theories (1) and (2) failed to lessen the number of new cases of oil derma-

titis being reported and of old cases entirely clearing up.

With this failure to experience noticeable results from the application of the first two theories, the third theory, wherein dermatitis is believed to be caused by the blocking of the minute orifices in the skin, glands and hair follicles with dirt and grease, became the point of focus and attention of the writers in the prevention of oil dermatitis.

Experiments were begun in line with this third theory with groups of workers under actual working conditions for a six months' period. Regular and vigorous attention was given to removing the residue of oil and dirt from the skin after each exposure. This was accomplished by frequent washing of the hands and forearms with water and a regular powdered hand cleaner (the usual cornmeal with lanolin). Following the cleansing of the skin, a protective cream was applied to cover the skin surface. This was done in line with the belief that such mechanical treatment would prevent further cases of dermatitis. The results of this experiment showed that some progress was made toward the prevention of dermatitis but the problem was not sufficiently brought under control for complete satisfaction.

Therefore, we resorted to our original theory that if proper personal hygiene practices were exercised and an effective cleansing agent were placed into use, that more notable results could be realized. The next six months' period found our experiments limited again to groups of workers under actual working conditions. Adequate washing facilities were installed in the department giving maximum exposure to a dermatitis condition. These consisted of wash stands with sufficient hot and cold running water coming from a mixing type faucet and as a cleansing agent, we selected a material that is classed as a sulphonated castor oil. We felt that frequent use of this oil would not only permit the employees thoroughly to cleanse their hands and forearms, but it would also automatically require them to mechanically saturate the minute orifices in the skin, glands, and the hair follicles with this oil and thereby prevent any contaminated oils, grease or dirt from entering and blocking these orifices so that the sabaceous glands could not secrete naturally. The use of protective creams was abolished during this experimental period.

The results of this experiment showed that much progress was made toward the prevention and elimination of oil dermatitis and brought the problem at this time well under control. Our medical records indicated that our number of new dermatitis cases were 53% less during the last six months' period as compared to the first six months' period. The following table depicts the results of the two theories followed to control dermatitis:

12 Months' Period—1944

Month	Total cases reported to First Aid. Treatments not necessary —diagnosis only.	Total cases reported to First Aid requiring extensive treatment by doctor.
January	62	12
February	62	12
March	101	10
April	96	9
May	77	12
June	49	11
	447	66
July	38	5
August	51	9
September	37	4
October	33	8
November	20	2
December	38	3
	217	31

In addition, it served to substantiate the claim made in preceding paragraphs wherein it is our belief that the majority of industrial dermatitis cases result from a lack of proper personal hygiene on the part of the person affected. These findings indicated that it is highly important that a routine procedure be established and carried out under supervision of the foremen and the Safety Department. Consistency and conscientiousness in following the recommended procedure is necessary for results.

In order that all employees will be stimulated in being conscientious about their personal hygiene, it is important that such stimulation be achieved through the installation of adequate washing facilities. Washing facilities should not be misconstrued to mean merely places to wash, but rather, should take into consideration the time allowed to wash, condition of water, suitable cleansing agents, towels, etc. For clarification purposes, the above items will be outlined below separately and briefly:

1. *Time Allowed to Wash*—Employees should not be expected to wash on their own time. If washing time is not allowed, we cannot expect the employees to wash thoroughly or carefully, and as a result, lost time will occur from industrial dermatitis. Time for washing should be granted at that time of the shift prior to lunch, and at the end of the working shift. It is reasonable to assume that approximately 10 minutes is enough time to allow employees to wash effectively.

2. *Condition of Water*—Sufficient hot water with ample washing space in which to use it freely should be provided. The lack of hot water is most discouraging to employees who are to remove heavy grease and dirt from their bodies.

3. *Suitable Cleansing Agents*—Just "soap" will not do. Rather, exhaustive studies should be made to obtain a cleaning agent that is non-irritating to the skin, and which at the same time acts as a skin conditioner to replace the fats that have been taken from the skin due to exposure to the various hydrocarbons (cutting oils, kerosene, gasoline, naphtha, etc.). Suitable cleansing agents are those containing no abrasive material, strong caustics, alkalis, etc. We have found that those cleansing agents made up of lanolin oil, mild wetting agents, and corn meal as a scrubber offer favorable results in counteracting dermatitis. Further, for those employees exposed greatly to the hydrocarbon group, we have found the application of a sulfonated castor oil or vegetable oil, to which is added a wetting agent and a mild non-irritating chemical cleaner, to be most effective in the prevention of industrial dermatitis. In some cases the use of this material completely cleared up cases of dermatitis. Such a cleansing agent as this prevents the defatting of the skin. Basically it is the defatting of the tissue that produces dermatitis.

4. *Towels*—Towels should be furnished and supplied to the employees for sanitary purposes. These should be individual and preferably made of cloth rather than paper. Cloth towels that are used should be laundered frequently. Drying of the skin after washing should be done not hurriedly but thoroughly to increase the mechanical action necessary to replenish the defatted tissue with the oils contained in the cleansing agents.

Accurate statistics of our medical records for the 1945 period are not yet complete. However, a study of those available indicate we have experienced an additional 50% reduction in our dermatitis cases. This reduction is a comparison with the last six months of 1944. Additional decreases are contemplated.

Protective clothing is also of paramount importance in the prevention of industrial oil dermatitis, since oil-soaked clothing having frequent contact with the body can cause dermatitis.

We have tested in our plants several materials made up into aprons to prevent the oil from saturating the work clothing. These tests revealed that the aprons impervious to oils were those made of the new synthetic resins. Such aprons afford protection to the employee to the extent that it prevents their working clothes from becoming saturated with oil, thus minimizing the exposure to contact dermatitis on the thighs and abdomen of those people so exposed.

Therefore, oil dermatitis can be prevented through conscientious personal hygiene on the part of all employees exposed to oil conditions. Industry must fulfill its obligations by: (1) Providing adequate washing facilities; (2) furnishing suitable cleansing agents (sulphonated oils); (3) providing sufficient and clean laundered towels; (4) allowing sufficient time for the employees to wash thoroughly and adequately; and (5) encourage employees actively to engage in a personal hygiene program.

The Place of Chemotherapy

—In the Treatment of Traumatic Wounds—

JOHN WINSLOW HIRSHFELD, M.D.,
Detroit

FOR years, surgeons have searched for a substance which could be placed in wounds for the purpose of preventing infection. Unfortunately, every substance which was tried not only proved ineffectual, but seemed to do more damage to the tissues than to invading bacteria. As a result, emphasis has been placed on the importance of careful surgery, rather than upon germicidal substances as a means of preventing infection in accidental wounds.

The discovery of sulfanilamide, and more recently of penicillin, both of which are capable of inhibiting the growth of bacteria in concentrations which are not injurious to tissues, has again caused surgeons to wonder whether these substances might not prevent wound infection if placed in wounds or administered systemically.

Sulfanilamide, its derivatives and penicillin have been available for clinical use for several years. A number of surgeons have tested the ability of these drugs to prevent wound infection. Our purpose is to examine the evidence which has accumulated in order to see if the use of these chemotherapeutic agents for the purpose of preventing wound infection is justified.

Let us consider first the sulfonamide compounds. We can say without fear of contradiction that these drugs when given systemically or placed locally in wounds do not decrease the incidence of infection appreciably. There are several reasons for the failure of the sulfonamides, one of which is the resistance to the sulfonamides of most of the bacteria which cause wound infections. The principal offenders in the majority of traumatic wounds are the staphylococci which are only slightly affected by sulfonamides, in concentrations that can be obtained through systemic administration. Clearly, then, the systemic use of sulfonamides cannot be expected to prevent infections in wounds since the most common bacterial invaders are not susceptible to the drugs.

If the concentration of sulfonamides which can be obtained by systemic administration does not inhibit staphylococci, why not put the drug in the wound where its local concentration will be limited only by its solubility in serum? The following table shows the solubility of the sulfonamide compounds in serum at 36° C.

Sulfathiazole,	184 mg/100 ml.
Sulfadiazine,	124 mg/100 ml.
Sulfapyridine,	61 mg/100 ml.
Sulfanilamide,	1000 (approx).

It would seem that the local implantation of sulfanilamides in wounds would provide an adequate concentration to prevent infection. It is important, however, to consider another factor, the rate of absorption from the wound. Sulfanilamide which is the most soluble and provides the highest concentration in the wound, is so soluble that it is rapidly absorbed from the wound, passing quickly into the general circulation. In fact, after 24 hours, very little sulfanilamide can be detected in a wound. By contrast, the less soluble sulfonamides are absorbed so slowly that they remain in a wound from seven to 14 days. They act as foreign bodies, cause tissue irritation, and exudation of serum which apparently nullifies their action and permits infection to occur.

We can conclude, therefore, that the sulfonamides administered locally or systemically will not be effective in preventing wound infections because, first, they are not very effective against the staphylococci which cause the majority of infections; second, when administered systemically, the concentration which can be obtained in a wound is too low to effect organisms which are not very susceptible; and third, when placed in wounds, the soluble compounds are absorbed so rapidly that they cannot be effective while the less soluble ones remain in wounds so long that they produce enough reaction to nullify any good they may do. The soundness of these theoretical considerations is borne out by the results which have attended the use of sulfonamides as a means of preventing wound infection. If one analyzes the results of the workers who designed experiments to test the efficacy of sulfonamides in preventing wound infection, he will discover that the men who advocate placing sulfa drugs in wounds either have not used controls or are using a series of cases done before the discovery of sulfonamides as controls. This method of comparison is apt to lead to fallacious conclusions. One learns further that in spite of the widespread use of these drugs in wounds there have only been a few careful studies in which controls were employed, and that the results of these demonstrated that sulfonamide placed in wounds or given systemically did not prevent infections.

Is the situation the same with penicillin? Not exactly. Penicillin has a greater range of bacterial activity, especially against the staphylococci, which, as we have stated previously, are the most important cause of wound infection. On the basis of its anti-bacterial activity, then, penicillin should be more effective. It, however, is of very little or no value when given locally, because it is absorbed from wounds very rapidly and does not have time to exert its anti-bacterial action. Penicillin must be given intramuscularly or intravenously at frequent intervals in order to maintain adequate concentrations in wounds. Although to date, the results of penicillin for the prevention of wound infection have been disappointing, I am not at all sure that they are conclusive. In many instances the dose has been too small. It may be that the use of much larger doses will demonstrate that penicillin is able to decrease the incidence of wound infection.

Even though penicillin were able to prevent all of the infections caused by those bacteria which are sus-

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ceptible to it, we would still have wound infections. A number of infections are caused by bacteria which are not susceptible to penicillin, such as Escherichia coli. Others are caused by a mixture of susceptible and non-susceptible organisms. Under these circumstances the organisms which are resistant to penicillin often liberate enzymes which destroy or inactivate penicillin so that organisms which would ordinarily be inhibited by penicillin continue to multiply.

In this connection, the new antibiotic, Streptomycin, offers considerable promise since it is effective against a number of gram-negative organisms such as E. coli. It may be that a combination of penicillin and Streptomycin given in adequate doses will prove to be a more effective means of preventing wound infection than anything we have known yet.

I would like to strike a note of caution, however. Probably no antibiotic will be able to prevent infection in the presence of bad surgery. By this I mean inadequate debridement of devitalized and dirty tissue, failure to remove foreign bodies, closure of wounds under tension, etc. I can perhaps illustrate this with a reference to a series of compound fractures which were divided into three groups. One group served as controls, one group was treated with penicillin and one with sulfonamides. For the purpose of analysis, these cases have been further divided into those with severe wounds and those with moderate wounds. In the 164 cases which make up this series it is readily apparent that the incidence of infection is correlated more closely with the severity of the wound and closure under tension than with the presence or absence of chemotherapy.

While the new antibiotic agents may prove to be of considerable help in the prevention of infection, they will not take the place of adequate surgery.

Surgical Drainage in Infected Wounds

FRANK T. McCORMICK, M.D.,
Detroit

WOUND infection still remains an unsolved problem. It was hoped for a time that some type of disinfectant could be found to combat bacterial invasion and result in prompt healing of tissues. No small part of the problem centers about types and methods of drainage, and this is still a controversial subject. The variety of procedures carried out have not always been due to the caprice and individual opinion of the surgeon but to various other factors which demand consideration, such as the type of infection, extent and quality of tissues involved, age and resistance of patient.

During the past generation, antiseptics have been devised—unlimited except by the gorgeous colors employed and claims of excellence by the manufacturers.

In recent years, we have realized the futility of attempting to sterilize an infected wound since, as is well known, an antiseptic of sufficient potency to kill bacteria is equally destructive to normal tissue and the defensive fluids of the body. The wisdom of disinfecting a wound only to skin edges and avoiding the use of chemical disinfection in the wound itself is almost universally recognized as good practice.

Christopher[1] states that normal human plasma, serum and lymph possess marked bacteriostatic powers. About the only organisms which will live in such fluids are the streptococci and, to a limited extent, the staphylococci.

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The benefits derived from the sulphonamides, both locally in the wound and parenterally, have been recognized for the past few years and, more recently the use of penicillin has shown brilliant results. Christopher states that, "Penicillin enjoys more promise in the local treatment of infected wounds than any of the agents hitherto employed because it is inocuous to tissue, is not inhibited by pus and the products of tissue degradation, and is absorbed from the surface of the lesion."

With limited time at our command, we shall confine the subject to industrial wounds, particularly of the extremities and those of an ambulatory nature.

Methods of early treatment should not be overlooked in combating the inflammatory changes and in order to restore the tissues to a normal physiological state. Chief among these are:

Bed rest to restrict bodily effort.

Elevation of affected part in order to favor return circulation for removal of waste products.

Application of heat and cold, judiciously applied, is often indicated and gives comfort to the patient.

It is almost axiomatic that drainage in infections is by no means ample. How often the surgeon is called upon to enlarge the original incision! Subsequent incisions add to the patient's discomfort and jeopardize functional results.

It is remarkable that, even with a so-called simple infection, the distention, the tenseness of the tissues involved and the amount of necrotic material found on incising are out of all proportion to what one would expect. But when definite inflammatory symptoms set in, evidenced by pain, fever (local and constitutional), swelling and other signs, prompt action must be taken by the surgeon. If the skin is unbroken, incision and drainage are indicated as soon as localization of pus is determined.

Incision is contra-indicated in lymphangitis, surface infections and cases where pus pockets cannot be encountered. Incision should be prompt, as soon as diagnosed, and the necrotic material removed as quickly and gently as possible. This allows healthy tissue to sequestrate dead material and to wall off an abscess cavity. The opening should be large enough to relieve pressure of the distended tissues and to accommodate the free flow of pus.

The wound should be gently dealt with, since undue trauma by hand or instrument induces further congestion and opens up new atria of infection. In addition, once the pressure exerted in a pus cavity is relieved, the contained body fluids, consisting of blood serum and leucocytes, play a partial protective part and should not be drastically removed.

This bacteriostatic power of the body fluids, according to Cutting[2] and Ferguson,[8] is due to the presence of anti-tryptic substances. They state that trypsin ferments in septic wounds form from the disintegration of tissue cells.

The presence of pus and large sloughs destroys or neutralizes the anti-tryptic power of tissue fluids. Hence, the value of sloughs in pockets of infection, also the necessity for their removal.

The action of natural tryptic ferments is partly benevolent and partly malevolent—beneficial in so far as removal of cellular debris is concerned—malevolent in so far as the neutralization of the anti-tryptic powers of the various tissue fluids is involved. In other words, there must be an alternate process encouraged to produce destruction of infected tissue and its removal. This explains the markedly good results of the Carrel-Dakin treatment for severe infections.[7]

In infected wounds, some form of drain is almost

always indicated. Stiff rubber-tube drains have come into disuse in recent years, owing to the fact that they give rise to irritation and may produce necrosis.

Gauze drains become saturated with secretion and may become a culture media for bacteria. They may clog the wound and prevent free discharge. A combination of gauze and rubber, such as the cigarette or Penrose drain, is best suited to most wounds.

Drains made of suitable rubber dam, folded or rolled, present a smooth surface and a minimum of irritation. They are soft and pliable and, consequently, show little tendency to pressure necrosis. Owing to the fact that the surfaces are in close contact with the wound, capillary attraction is favored and drainage is not entirely dependent upon gravity.

Babcock,[5] "Non-adherent drains should be removed from clean wounds in 24 or 48 hours but from septic wounds only after six to 12 days. Early removal from septic wounds, especially streptococcic, has caused many fatal bacteremias."

In recent years undue reliance has been placed on hypertonic solutions. Taylor[6] made an interesting series of experiments on rabbits. He found that the amount of fluid capable of being withdrawn by hypertonic solutions from one square inch of wound surface amounted to 1.2 cc. to 1.5 cc. per hour. Experiments showed about a similar absorptive power regardless of the hypertonicity and nature of the solution used.

His solutions were restricted to 5% and 10% sodium chloride, 20% glucose, 16% and 32% magnesium sulphate. He observed that higher concentration of these solutions did not increase the amount of fluid withdrawn, and indicated some damage to the tissues as evidenced by capillary bleeding. Also, "the wound tissues continued to absorb enough salt to maintain quite an edematous state."

Experiments with wet dressings indicated that the solutions reached only the superficial tissues. The deeper tissues, containing active infective material. were not reached. The benefits derived then, according to his summary, from use of continuous wet dressings, were only its "poulticing effects, prevention of crusting and allowing better drainage, also increase in flow of capillary blood."

In conclusion, Taylor recommends isotonic saline or one to 5,000 mercuric chloride as giving the same beneficial results also, the 16% magnesium sulphate.

Landau,[4] in his experimental research on hypertonic salines in the treatment of wounds, states that the hypertonic saline has little or no effect in the sterilizing of wounds. From these observations, we gather that hypertonic solutions applied to infected wound surfaces have no value over isotonic solutions and have little or no antiseptic virtue.

Furthermore, damage to the tissues may be expected from bleeding and edema. Especially is this true in the treatment immersing an infected extremity in a continuous hot bath of hypertonic saline or magnesium sulphate solution. If free discharge of infected material is restricted by skin or fascia, hot poultices increase the swelling and distention. Pus then takes the path of least resistance and invades the deeper fascial spaces or tendon sheaths.

We are inclined to condemn the undirected application of this treatment. It is productive of edema and results in a "water-logged" condition of the tissues.

We have seen disastrous results following the use of hot moist dressings or immersion in a solution of Epsom salts. The public should be warned against the unwise use of what could be a most valuable adjunct to surgery.

In the search for better methods in treatment of wound infection, an important physiological principle has been ignored or at least under-emphasized—that of capillary attraction. All about us, nature has utilized this method in drawing up fluids in the case of thirsty plants and shrubs. Even trees provide moisture for their foliage—scores of feet from the ground. Moisture is found high in the top-most twigs and leaves after weeks of dry weather. This is an example of nature's capillary system. In like manner, fluid is drawn up by a wick in a lamp, the flow passing from the moist end to the dry, especially when the wick is lighted. The moisture tends to equalize itself so that always a current is set up toward the dry end of the drain. It is only reasonable to expect that a drain of porous material protruding from a discharging wound and dry at the opposite end, will provide a continuous flow. Adapting this process to an infected wound, we have only to insert a soft rubber or gauze drain in the wound cavity and dressings, loosely fluffed, to add to their absorbability. The outer dressings are moistened intermittently and *allowed to become dry.*

Sulphathiazole cream or vaseline is usually applied to edges of wounds to protect the raw surfaces and keep the drain from clogging. If an extremity, it is suitably splinted for purposes of rest. The external dressings are moistened about every three hours. This can be done by the patient himself at home. The solution used may be plain water, boric acid or Dakin's solution. The action as above stated is about the same whether it is hypertonic, isotonic or not. A reasonable regard for asepsis is observed. Dressings are changed as infrequently as possible. We have used this method in our clinic for about 20 years with excellent results.

SUMMARY of treatment.

Our mode of procedure for infected wounds, therefore, should be:

1. Free incision, exposing infected areas.
2. Insertion of sulphanilamide or sulphathiazole.
3. Protection of raw surfaces of wounds by sulphathiazole cream.
4. Ample drainage with rubber tissue or vaseline gauze.
5. Dressings and splint to promote rest of parts.
6. Periodic moistening of dressings allowing them to dry between times.

As time goes on, highly-touted drugs or methods of treatment receive professional acclaim and are adopted with enthusiasm only later to be found inadequate and lacking in efficiency. Thus we have passed through the disappointing phases of tannic acid treatment for burns, the maggot treatment, and, even now the reputation of sulphonamides used locally in wounds is declining. On the other hand, the forces of nature are constant. We cannot ignore them. They should be utilized to the fullest extent.

The principle of capillary attraction applied with good surgical procedure is most effective in the drainage of infected wounds.

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Fracture Problems

—Fracture Therapy by Internal and External Fixation—

BENNETT R. PARKER, M.D., F.A.C.S.,
WILLIAM L. CULPEPPER, B.S., M.D.,
Chicago

THE use of skeletal pinning and external fixation is indicated in many compound comminuted fractures in the presence of infection and may be used with a wide margin of safety. This technique provides proper immobilization without involving the infected area, enabling the surgeon to carry out his selected technique for treatment of the infection.

When skeletal pinning and external fixation are used, size, position and angles of the pin should be determined by the problem of each individual case and not by specified predetermined positions to accommodate any mechanical appliance used for fixation or reduction of these fractures. Success of the procedure is determined by the surgeon's ability to cope with the problem at hand and a selection of equipment universal and flexible enough to meet the requirements of the existing conditions.

Realizing that at times we must assume high operative risks because of the necessity of immediate treatment, we select a method of treatment offering maximum immobilization with a minimum amount of trauma. In our experience, the proper application of external skeletal fixation in selected cases offers a minimum amount of trauma, gives more safety and control of the patient and allows early active and passive motion.

We have selected several different cases to present, each with its individual problems to solve, and each with its particular method of immobilization.

G. W., FEMALE, age 36, on February 1, 1944, was struck by an automobile and sustained a badly comminuted compound fracture of the upper third of the tibia and fibula. There was a "T" fracture into the joint cavity. (Fig. 1, A.P. and lateral.) We first saw this patient on February 8, 1944, at which time she came to the hospital with a cast on her leg. On removing the cast, a large amount of pus drained from the open wound on the anterior aspect of the upper part of the tibia. In spite of the marked infection present, external skeletal fixation was applied and the fracture immobilized under general anesthesia. (Fig. 2, postoperative films, A.P. and lateral, 2/28/44.) Drainage tubes were inserted deep into the wound and the wound was irrigated for a period of five weeks at which time the tubes were removed. (Fig. 3, A.P. view, 3/24/44.) In the subsequent two weeks the wound had granulated in satisfactorily.

This patient was up on crutches in nine weeks after the operative procedure, and the external fixation was removed on May 18, 1944. A posterior mold was applied and kept in place until August 1 when a circular cast was applied and the patient returned home on crutches. October 31, 1944, the cast was removed and the physical therapy treatments to the leg and especially to the knee were instituted and partial weight-bearing begun. On the last visit, June 18, 1945, this patient was found to have one-half to three-quarters inch shortening in the left leg and no bowing in spite of the fact that the x-ray would lead one to suspect that there would be some external bowing present. (Fig. 3A, A.P. and lateral, 6/14/45.) The knee action is excellent. Flexion at the knee is from 95 to 100° and there is full extension. With the sole of the shoe built up one-half inch, this patient walks without a limp.

Without doubt, a severe infection in this compound comminuted wound cleared up very promptly because of the rigid immobility of the leg. If there is any question about error in handling the case, it would be that we removed the external fixation a little too soon. It probably would have been better to have left on the fixation another four to six weeks but the patient was so insistent upon having it removed that we let ourselves be guided by her desires rather than our best judgment. It is our opinion that if we make an error in the removal of external skeletal fixation, it is an error on removing it too soon. In our experience, if we have no pressure necrosis around the pin sites in four to six weeks, it is not likely that we will have future trouble with them.

R. S., MALE, age 16, weight 216 pounds, was injured in December, 1943, while riding on a motorcycle that collided with an automobile, sustaining a transverse fracture of the mid-shaft of the right femur, fracture of the patella and a perforating wound of the knee joint. This patient shows how former treatment has a direct bearing on methods of approach for immediate surgical management.

Fig. 4, x-ray taken five weeks after injury, (our first contact with the patient) shows a transverse fracture of the right femur in the middle third with lateral and posterior displacement of the distal fragments. There was a marked shortening of the leg and an over-riding of about three inches as shown on the lateral view between the white arrows.

In the interval between the injury and the date on which we first saw the patient, he had been put up in traction in a Thomas splint. The ring of the splint was too small and it did not reach high enough on the thigh to bear counter-weight properly, and the ring was suspended from the Balkan frame in such a manner that it acted as a constriction just above the mid portion of the thigh, as in Fig. 4. This resulted in partial obstruction of the venous and lymphatic return. The thigh was markedly swollen, which was very likely a factor in the extreme shortening in that the swelling had bulged out the fascia, thereby shortening it.

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 3A.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Inadequate weight of five to 10 pounds for traction in a large muscular person of 200 pounds was also a factor. Note the amount of callus on the original x-ray (Fig. 4).

February 3, 1944, the patient was taken to surgery and, under general anesthesia, we inserted a pin unit in the proximal and distal thirds of the femur and an attempt was made to break down the existing callus by gentle manipulation and rotation. Then the leg was placed in an anatomic reduction splint and traction applied up to the point of tolerance. (Fig. 5, 2/3/44, A.P. and lateral.) We succeeded in reducing the over-riding approximately one inch by this traction and manipulation. However, the line of depression in the skin along the length of the ilio-tibial band was the deciding factor in not trying any additional traction at this time. The thigh was then suspended on the Balkan frame and the limb held there for a few days to reduce the edema, which disappeared quite rapidly.

February 8, 1944, five days from the last manipulation, the limb was placed in a reduction splint for the second manipulation. On viewing the x-ray (Fig. 6) it was decided that the limb should be lengthened gradually, so we incorporated equalization rods and increased the extension one-eighth of an inch a day, by means of an adjusting nut. At first these adjustments had to be made with a wrench but they soon loosened so that we could turn them with our fingers. Fig. 7 shows sufficient length so that internal bowing and keying in of the fragments completed the reduction as

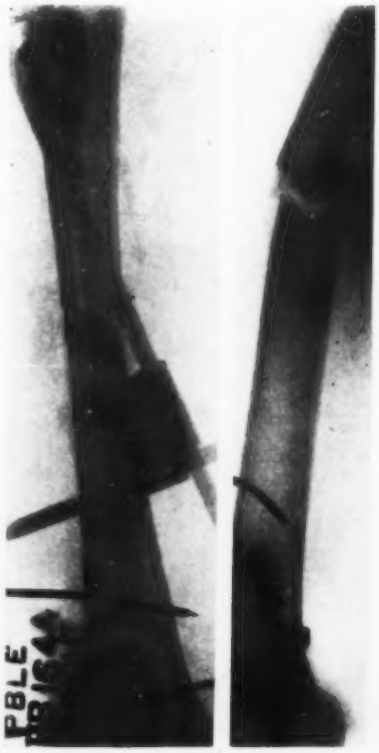

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

seen in Fig. 8. From that time on, no further manipulation was necessary. Fig. 9, March 20, 1944, shows an abundance of callus formation (45 days post-operatively). This patient was employed in a very heavy type of work and 10 days after x-rays taken July 6, 1944, shown in Fig. 10, he returned to full-time duties and has had no further trouble whatever.

This case illustrates a problem to be faced in handling fractures long after injury. Here we had a large amount of callus formation at the time we first had an opportunity to see this boy, with marked shortening and over-riding. It took three manipulations under general anesthesia, with intervals of time to allow more traction, to succeed finally in pulling down this fracture sufficiently to reduce it. I know of no other way in which this could have been accomplished other than an open reduction which would have been a formidable procedure and would have necessitated some type of internal fixation, a cast and a much longer period of bed confinement.

B. B., MALE, age 49, in May, 1944, fell out of a second-story window, resulting in multiple fractures of the pelvis, including the following fractures on the left side: Colles', acetabulum, base neck of the femur and comminuted os calcis. We evaluated this patient as a bad surgical risk with multiple fractures. His non-protein nitrogen was 80 mgm. percent. He had a chronic glomerular nephritis with the classical findings. June 2, 1944, under general anesthesia, we reduced the Colles' fracture and fractured os calcis and held them by external skeletal fixation. The base neck fracture of the left femur was reduced and fixed with a Smith-Petersen nail.

In examining the anterior posterior x-ray which was taken immediately following the nailing in surgery, as shown in Fig. 11, there was a marked separation of the fragments. At the time this x-ray was developed we had already made our closure and the patient was conveyed to his bed in the usual manner on a hospital cart and was confined to bed for a considerable time because of multiple fractures of the pelvis and also because he had developed pneumonia. No attempt was made in any way to impact or overcome the marked separation of the fragments.

June 6, four days after the operation, another anterior posterior x-ray was taken of the left hip. Fig 12, 6/6/44, shows that the separation of fragments had completely disappeared and the fragments were now in apposition. The next check-up x-ray was taken on July 21, 1944, as shown in Fig. 13, which was 45 days later, and shows the apposition and position of the fracture unchanged.

It is not our belief that impaction at the time of nailing a fractured neck of the femur is indicated. In fact, we feel that it is contra-indicated. The first x-ray taken following the nailing shows marked separation of the fragments and four days later the fragments were in contact. The apposition of fragments occurs by muscle action, as shown by this case, and not by weight bearing. The mechanics of this method of using a Smith-Petersen nail is such that the nail has a

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

Fig. 18.

Fig. 19.

Fig. 20.

three-point suspension and bearing weight causes stresses upon the nail in such a manner that a change in position cannot occur while weight is being borne. This technique of application of the Smith-Petersen nail was developed by DR. H. W. WELLMERLING, of Bloomington, Illinois, and published in INDUSTRIAL MEDICINE.

H. P. This man was 74 years of age and had a moderately advanced Parkinson's disease and an old bi-lateral pulmonary tuberculosis, and is physically much older than his age would indicate. He was injured on July 8, 1944, (Fig. 14) when he fell on the sidewalk and sustained an intracapsular fracture of the right femur.

June 20, (Fig. 15) under local anesthesia, we reduced this fracture and immobilized it by means of a Smith-Petersen nail. The patient was mentally sluggish because of his Parkinson's disease and, while we admonished him not to walk on this leg, he did so the first day following the operation. In view of the fact that we could not control him, we allowed him his liberty in walking, which he did without difficulty. We watched him closely and with interest and at no time did we see any evidence of difficulty.

The final x-rays (Fig. 16) taken on August 22, 1944, two months after the operative procedure, show no apparent change in the position of this fracture. Neither do we see any evidence of change in the pathology of the structure. This patient was seen again three and a half months after the operation at his home by an associate who reported that he was walking around without any difficulty.

We wish to point out that the line of fracture in this case is approximately 80° (Fig. 14) and is one that has a great shearing force. There has been no apparent change in the position of the fracture in spite of the fact that the patient has been walking since the first postoperative day. We considered this man at the time of his operation a very poor surgical risk and the operative procedure carried out under local anesthesia offered a minimum amount of risk.

MRS. J. S. is an obese patient, 66 years of age, who was injured when she fell on the bathroom floor on February 21, 1944, (Fig. 17) sustaining an intracapsular fracture of the left hip. She was admitted to the hospital the same day of injury, irrational, vomiting, with involuntary urination and a blood pressure of 250/130. It was quite obvious that we were dealing with a uremia as well as a fracture. Urine examination showed albumen 3 plus, many granular casts, pus and R.B.C. Non-protein nitrogen was 90.5 mgm. percent. This woman also had large fibroids of the uterus.

February 28 (Figs. 18 and 19) we reduced the fracture under local anesthesia and according to the method used on the previous patient reported, immobilizing it with a Smith-Peterson nail. The patient was confined to bed approximately fourteen days because of the uremia, after which she was up in a wheelchair. Three weeks postoperatively she was up and about on crutches and partial weight bearing was started two months later.

The last x-rays taken, July 21 (Fig. 19) five months postoperatively, show no apparent change in the position of the fracture and the patient was fully recovered from her injuries.

The pre-operative clinical picture of this patient was very poor. She was in uremia, had a marked hypertension and nephritis, further complicated with an intracapsular fracture of the right hip. She was con-

Fig. 21.

Fig. 22.

Fig. 23.

Fig. 24.

Fig. 25.

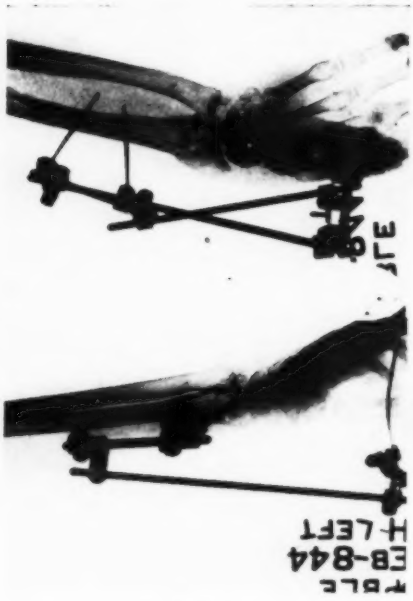

Fig. 26.

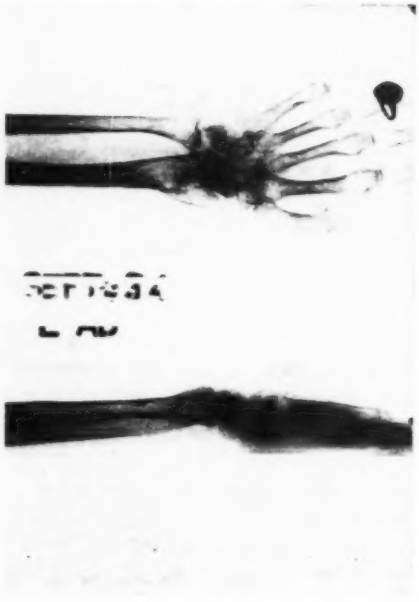

Fig. 27.

sidered a bad risk and the operative procedure was carried out under local anesthesia. Except for cardio-renal vascular syndrome, this patient made an uneventful recovery and at present is in excellent physical condition. Her blood pressure is now stabilized between 160 and 170, and she is leading a normal life for a woman of her age.

McElvenny* states that an excellent result in this type of fracture is one in which (a) there is no pain or spasm; (b) there is no limp; (c) there is equal leg length; (d) there is a complete range of active hip motion including full internal rotation; (e) the patient to walk and climb requires no external aid; (f) on roentgenographic examination, the neck is of practically normal length, the head is smooth with normal density, the joint space is maintained, and the facture has healed with unbroken lines of trabeculation crossing the fracture site.

He further states that clinically, patients who are going to have good hips are well on their way toward this end by five weeks after fixation. Patients who are going to have poor hips at no time handle the leg well following fixation. Limp, groin pain, adductor spasm, lack of internal rotation, and lack of full active control of the limb are present in all of these cases to variable degrees. From the time of fixation until the final check-up, these failures never do get along.

M. C., A FEMALE patient 72 years of age, was injured on February 7, 1944, when she fell from a ladder, sustaining a Colles' fracture of the left wrist and a comminuted intertrochanteric fracture of the left hip. In the pre-operative x-ray, you will notice that the greater trochanter is completely separated from the upper part of the femur. This fracture was reduced under local anesthesia and external skeletal fixation was applied. Figs. 22 and 23 show two adjacent pins placed through the distal and proximal fragments. Two converging pins were placed through the distal fragment and externally connected. We immediately applied a large pressure dressing covering the entire area of the pin sites of the upper femur to minimize the "running" of the soft tissues on the pins. Seven and one-half months post-operatively (Fig. 24) it was noted that the greater trochanter, although not immobilized with any fixation, is in good position and the fracture is completely healed and the trabeculae structure can be traced.

The Colles' fracture was also reduced under local anesthesia at the same time and external skeletal fixation was applied (Figs. 25 and 26). The patient was permitted to be up in a wheel chair on the third post-operative day. Twelve weeks later, after the fixation of the Colles' fracture had been removed, she was permitted to be crutch-ambulatory. On the final x-rays of the fracture of the wrist taken September 28, (Fig. 27) we call attention particularly to the lateral view which was taken with the tube at an angle of 25° pointing toward the thumb, with the cassette placed on the radial side. By this method we have a more accurate way of showing the angle of the wrist. (This will be covered in detail later in the paper.)

K. C. THIS patient, age 21, sustained an almost transverse fracture of the mid-shaft of the right humerus on April 18, 1944 (Fig. 28) when she fell from a horse. April 20 (Fig. 29) under local anesthesia, external fixation was applied and the fracture reduced and immobilized. The fourth postoperative day, she returned to her position as a stenographer and was taking shorthand and writing on the typewriter without

Fig. 28.

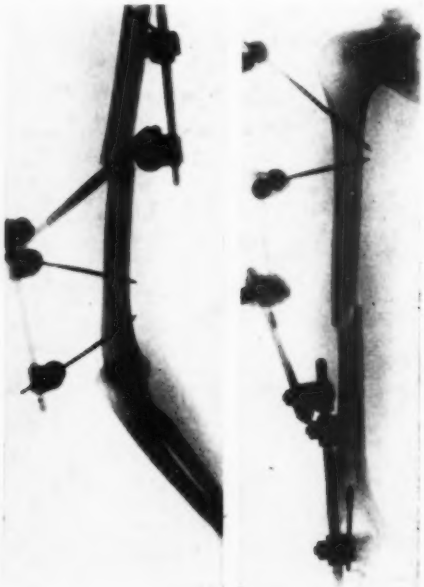

Fig. 29.

Fig. 30.

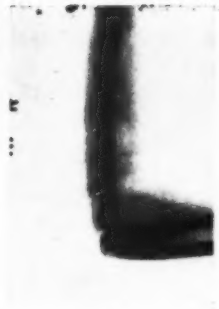

Fig. 31.

Fig. 32.

difficulty. She carried on her usual occupation efficiently from that time on. The skeletal fixation was removed on July 6, which was the tenth week postoperatively. (Figs. 30 and 31.) The final checkup x-ray taken on August 31 (Fig. 32) showed complete bony union. Since this time, this young lady has joined the Waves and is in active duty somewhere in England. Her recovery was uneventful.

All fractures present a condition which can be termed "unphysiologic" and each fracture presents individual complications with which to deal. In recognizing and handling these complications, it is important to know what is normal and what is abnormal clinically or when the x-rays are viewed from the different and lateral views are to be taken at exactly 90° with the tube centered exactly over the site of the fracture. Many fractures require a scout film to determine the "exact level." This level is then marked on the skin by a dye to enable the x-ray technician to identify the position for placing the tube in relation to the fracture. At each subsequent check-up, the tube must be placed at precisely the same position as it was when previously used and this is determined by accurate notes on the x-ray report indicating the tube center placement previously used.

In the past, we have had considerable trouble in determining whether we have made the proper correction of the articulating surface between the head of the radius and the metacarpal bones due to the fact that we have always used the standard and accepted technique of taking the lateral view of the wrist. Fig. 36 is a normal view of the wrist with the tube and cassette at right angles to the radius. In this view it is very hard to ascertain whether we have the proper articulating surface. In order to determine this relation, we have devised a technic of placing the tube at a 25° angle, pointing toward the thumb, and with the cassette parallel to the radial side of the arm. We readily note that there is a great difference between these two views and that the articulating surface is easily discernible. Should the tube be placed at a 25° angle pointing toward the elbow (Fig. 38), there is an over-

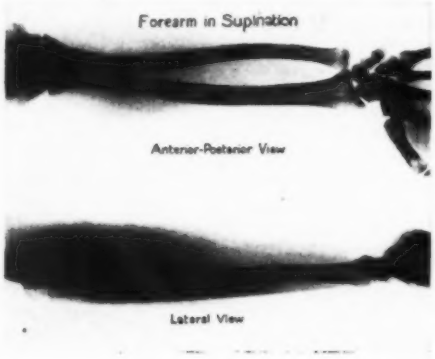

Fig. 33.

Fig. 34.

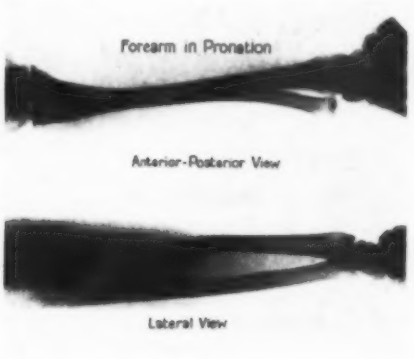

Fig. 35.

erent known positions. Figs. 33, 34 and 35 illustrate the wide deviation in the relationship of the bones of the normal forearm in the three standard positions.

The tube is centered in the mid-forearm and the accuracy of the placement of the tube can be determined by the condyles of the humerus. To assure early restoration of function with the least amount of disability, one must have a mental picture of these three positions of the normal forearm. The x-ray findings must coincide with the clinical picture. It is important also to know in what position the patient was at the time of x-ray and that this position was maintained while taking the x-ray pictures. The anterior posshadowing of the structures and the joint surface cannot be identified easily.

SUMMARY: We have selected from a series of our cases a few problem fractures which we feel would be of interest.

The techniques and methods used and described by the author can be recommended by the final results obtained.

Problem fractures which confront us today must be handled by a method which will give rigid fixation whether the fracture be new or old, infected or not infected, combined or not with other fractures and com-

Fig. 36.

Fig. 37.

Fig. 38.

plications, all of which makes the patient a surgical risk to a greater or lesser degree. The patients are afforded an opportunity of being ambulatory or at least the privileges of a wheel-chair, if additional complications will not permit the early ambulation. This allows motion, therefore increases all physiological functions of the body which, in turn, enhances the patients' rate of ultimate recovery.

X-rays should be carefully and accurately taken and read. They should always include the articulating surfaces of the contiguous joints of the fractured member. Local anesthesia is used in a large number of our cases, especially those which are considered poor surgical risks. Contrary to some authorities, we do use external skeletal fixation in fractures in which infection is already present but we wish to point out clearly that the fixation is placed well away from the infected area.

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Neuropsychiatric Aspects

—Of Industrial Accidents—

JOSEPH L. FETTERMAN, M.D.,
Assistant Clinical Professor of Nervous Diseases, Western Reserve University, and Director, Neuropsychiatric Institute, Cleveland, Ohio

SOME accidents are machine-made, others man-made. The first group includes accidents arising from defects in machinery, in material, from the violence of nature. These require the attention of safety engineers. The second group comes from defects in man himself, errors in judgment, defective coordination, unstable emotional control. The accidents which are man-made concern the human engineer—you and me—and will be the subject of this paper.

Organic Causes of Accidents

DANGER lurks everywhere and safety depends upon care and caution. In every industrial plant are moving vehicles, automatic machines with cutting and compressing parts, uneven and slippery floors to injure the unwary. Men and women at work must be alert and skillful to avoid injury. Therefore, those who are handicapped by an impairment of the central nervous system are more likely to have injuries unless they overcompensate by care. The overuse of alcohol is an invitation to injury.

Let us briefly consider several organic causes of accidents:

A. THE EPILEPTIC: Epilepsy may be defined as a disease characterized by repeated attacks of diminution or loss of consciousness with the release of muscular activity. The epileptic at home or in industry, who, without warning, loses consciousness and falls, is likely to be hurt. As a consequence, scars from bruises and lacerations, not to mention spine fractures, are common among such persons. Indeed the fear of such hazards was so great that, in the pre-war period, industry was reluctant to employ epileptics. Fortunately the manpower need of war plants and the reduction in seizures made possible by new medication[1] led to a wider employment of epileptics. For the most part, the controlled epileptic has demonstrated his industrial usefulness and deserves to be hired. From the point of view of accidents, however, one must keep in mind the posibility of epilepsy as a cause of injury, particularly those minor attacks referred to as petit mal and psychomotor equivalents.

The epileptic whose spells are of the grand mal type is recognized and is likely to be promptly and adequately treated, but one who has momentary stares and lapses and blank periods during which he moves on automatically, may pass unrecognized until he has had some accident. During such periods of diminished consciousness, however brief, if the individual is to continue operating his machine or walking, he is apt to injure himself. I recall the unusual incident of a soldier who was on guard duty in North Africa and who accidentally and without cause, fired his gun, killing another soldier in a nearby tent. Investigation established clearly no basis whatsoever for this accidental killing and so the soldier was referred for neuropsychiatric study. A careful history elicited the fact that for a considerable number of years this man had been subject to momentary spells of staring and blankness during which his head might sag, and that he had had rare occasions of automatic behavior. Brain wave tests confirmed the diagnosis of psychomotor epilepsy. The soldier was discharged from the army and not imprisoned.

B. BRAIN DISEASE: An intact brain is essential to safe and happy living. Any disorder of the brain will impair judgment, decrease attention, disturb coordination, and quite commonly produces disturbances of consciousness, including epileptic attacks. A common disorder of the brain is paresis, and sometimes the initial evidence, one might say the clinical debut of the disease, is the occurrence of an accident. In my book, "The Mind of the Injured Man,"[2] I recited the case history of B.W., who had become conspicuous among his fellow employees, window cleaners, for what was looked upon as bravery. It had been known for several months that this man would clean windows in the tallest of buildings, disdaining the use of safety belts. On one occasion he volunteered to clean the windows on a windy day, standing on icy window sills without using his belt. He laughed when he was reprimanded for not taking the safety precautions. Several months after this had been observed, he was driving a company truck along a main boulevard when he turned into a side street without giving a warning signal. In the ensuing accident he sustained bruises of the forehead and minor contusions of the arms and legs. The force of the blow did not render him unconscious. He was merely jarred and bruised. During the following days he became unusually talkative, laughed rather cheerily, and made some odd and irrational comments. The neurologic study showed no evidence of significant brain injury, but revealed fixed pupils and abnormal reflex responses. The mental status showed defect in memory, a mild euphoria, impairment of alertness and attention. The spinal examination showed no blood but strong evidence of syphilitic disease.

This is an example of an injury occurring in a paretic and resulting from the failure in judgment and attention because of the brain disease. Cases of

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Presented at the meeting of the Chicago Society of Industrial Physicians and Surgeons, Chicago, November 5, 1945.

this kind are often mentioned as evidence that injury produces active symptoms of paresis. In this instance, however, the bravado which came from an inability to appreciate danger represented the early, even though unrecognized stages of the disease, while the accident was the dramatic event that led to the recognition of paresis.

Less common are falls and injuries due to arteriosclerosis of the brain and brain tumor. Occasional accidents are related to disorders of the spinal cord. I have seen examples of falls that came in patients with tabes dorsalis, dorsolateral sclerosis, and other processes which caused muscular weakness, spasticity, impaired sensation, and ataxia. Obviously the unsteadiness, the inability to walk in the dark may lead to missteps, falls and collisions. For instance, Mr. R.E. had several minor falls in which he sprained his ankle and bruised himself. Little attention was paid to these mishaps until the episode when he fractured his leg and the healing was delayed. A large overgrowth of tissue developed in and around the ankle. The examination showed a swelling which was crackly on palpation, hypermobile, and painless. It was obviously a Charcot joint, and there was both neurologic and laboratory evidence of locomotor ataxia. Briefly then, we may say that accidents can arise from organic defects of the nervous system. These are not as common as one may expect because the average handicapped person protects himself by prudence. Thus it is that handicapped individuals, especially war veterans, with some organic defect such as an amputation or weakness of a limb can work successfully. Though handicapped, the individual can protect himself by care and prudence. The more common man-made accidents arise from emotional and mental disturbances, and these will be next considered.

The Psychiatric Problems in Accidents

RAWSON[3] makes the statement that some 88% of accidents are "personal." Dunbar,[4] in an analysis of accidents which have occurred in the previous history of cardiac and fracture cases, reported the following figures: Among cardiac patients "true accidents" occurred in 10%, while accidents due to personality factors occurred in 12%. A control group of 10 fracture cases had 90 previous accidents due to personality factors. Rawson[3] makes the statement that investigation by four industrial concerns of the causes of traffic accidents revealed that it was not the elements nor external conditions but the man himself who was the important factor.

Adler[5] made a study of 130 workers who had repeated accidents and listed the following causes in order of importance: 1. Revengeful attitude, 2. "Unlucky," 3. Longing to be pampered, 4. Overambitious and 5. Overfearful. Alcoholism, feeblemindedness, and other organic diseases completed the list. Wampler[6] found that faulty attitude, failure to recognize hazards, impulsiveness, irresponsibility, lapses in attention, nervousness and fear are the major causes of accidents. Smith,[7] in an interesting book, takes a broader view of the subject and appraises such items as industrial conditions, personal conditions of workers, and psychologic factors. Let us glance at several types of personality disorder and how they are related to accidents.

A. THE MALINGERER: The malingerer is the one who deceitfully and purposefully causes self-injury for a motive such as gain. One encounters, although rarely, men who have inflicted injuries to their eyes, ears, fingers, and toes in order to avoid military service. Though such purposeful self-injury may occur in industrial life, it is exceedingly rare. In medicolegal practice, however, there are more common instances of exaggeration of symptoms for compensation motives.

B. THE PSYCHOPATH: A psychopath is a person who may be physically strong and intellectually bright, but who is morally warped and whose aggressive, impulsive quest for satisfaction causes him to go against the current of normal social behavior. The "grand mal forms" are the criminal psychopaths whose long and painful careers of antisocial conduct lead to a rest cure in an institution of confinement. The minor forms are the fault-finders and trouble-makers, the inadequate, dissatisfied, or belligerent personalities whom we encounter in our shops and plants. They seek for comfort and pleasure without working for it, and so they forge checks and steal cars. They want praise and recognition, so they make up stories like our friend, Major Hoople, who is so charmingly depicted in the comic pages. Though the psychopath may disturb those around him, he himself feels mistreated and unfairly dealt with. Thus a psychopath will often do some daredevil stunt, invite injury so that he may get attention, praise, or admiration. I recall the case history of a young man who was discharged from the army because of inaptitude and inability to get along in his outfit. The discharge was given because of a painful back. This young man told his civilian friends that he had been injured in a plane crash and that he had parachuted from a remarkable altitude. This "story" was but a restatement of the fact that ever since boyhood he had jumped from high places, usually on a dare. The young man had scars on his face, had sprained and fractured his ankle on several occasions, and had injured his back. The history revealed that in his childhood he was extremely jealous of an older and more stable brother who did well in school and who had won praise from his teachers and parents. Our patient was impulsive, unstable, did not apply himself studiously. He sought for admiration by stunts. Thus it was that at about 10 he jumped from a two-story porch, fracturing his leg. A year or two later he dived from a high board into shallow water sustaining further injuries. Again and again he would display his prowess as a jumper to win the plaudits of the crowd. In these jumps he sought for admiration, he strove to outshine his successful brother and there may have been the unconscious idea that when he was injured, he was punishing his parents and the brother as well as himself.

C. DEPRESSIONS: All of us get depressed for brief periods, but those who suffer from a depressive illness continue to be morose, miserable and in distress for a long period of time. A state of depression, brief or enduring, brings with it not only somatic difficulties but self-accusation, a feeling of worthlessness of guilt because of wrongdoing. The feeling of guilt attended by a fear of retribution often invites injury. Says Stephen[8]: "In order to forestall this retribution, which is felt to be inevitable and even justified, the child and later the neurotic, may be driven to almost any lengths in the way of self-punishment. When people keep perpetually falling, cutting, bruising and hurting themselves apparently by accident, it is possible that these 'accidents' have an unconscious purpose behind them, the need to find an outside punishment to satisfy the inner feeling of guilt. Even serious accidents leading to permanent injury or death may come about in this way."

We are all familiar with the everyday experience

of a married man who has fallen in love with his secretary and has made a habit of driving her home. Interest led to attempts at intimacy though no actual sexual contact had taken place. But this man was highly religious and overconscientious and it occurred to him one day that perhaps his fumbling attempts at intercourse had impregnated the young woman. Thus he began to brood. "What if she does become pregnant? I'll ruin my home; I am a scoundrel; I just can't face it; I wish I were dead." And then, as he drove along, it occurred to him that an accident would solve the whole problem. Almost without thinking, he crashed into a pole and did have a minor collision.

Another example from practice is that of a patient who had been a superb horsewoman all her life. In the middle forties she had become depressed, tense, nervous and sleepless. She feared that she had lost her charm and that she was being neglected by her husband. She reached the point of believing that life was hardly worthwhile. "I am such a failure; I am getting old so quickly; I am so miserable; both my family and I would be better off if I were dead." Her husband tried his best to cheer her and insisted almost forcefully that she go out riding. Reluctantly she complied, but fell from her horse and fractured her femur. When she was asked to explain in detail how the fall occurred, she answered: "I was so miserable, even when I was on the horse I wasn't enjoying the ride at all. Life seemed so dreary. Oh, what was the use of it all? At that moment the horse stumbled, I felt myself lurch. I could have held onto the reins but it seemed so much easier to let go and I found myself on the ground with my leg broken." Such an accident illustrates the theme that Menninger[9] has emphasized with the title of "partial suicide." According to Menninger: "Self-destruction may be extreme (suicide) or partial . . . . In a sense the individual submits himself to the possibility or certainty of an accident in which he has at least a chance of escape rather than the positive self-destruction."

In our plants and factories are many persons who are depressed either because of physical reasons (endogenous) or because of situational factors at home or at the job (reactive). An accident occurs which is found to be the answer to a depressed patient's escape. "How I hoped an accident would happen. As I was a passenger in the streetcar coming home, I wished that it would crash . . . . As I was crossing the street, I hoped that I might be struck by an automobile which would end my suffering." The depressed patient who has an accident obviously hurts himself and yet at the same time hurts others symbolically. According to psychoanalysis, many depressed patients, in attempting self-destruction, are unconsciously destroying the images of others who have been incorporated within themselves. Let us consider the experience of a colored woman, whom I saw on the wards of university hospitals, who had been injured in a fall from a porch. When she was brought to the accident room, she had in her arms her husband's hat and coat. When asked to explain how she happened to fall, she gave the following reply: "I hadn't been happy for a long time. My husband used to be nice to me and was very attentive, but lately he has become cold, he stays away nights and has even been very angry. I was sure that he was runnng around with other women while I sat home moping and lonesome. It got so I couldn't stand it any more and so I decided to kill myself by jumping from the porch. I took his hat and coat because I wanted them with me in my grave when I died." It is obvious that there was the unconscious desire to destroy him in allowing hs garments to fall to the ground as she jumped. This combination of motives intermingled, self-punishment, escape and revenge, occurs again and again in the history of accidents resulting from nervous illness. Ackerman and Chidester[10] cite the following example: "A youth was driving his mother on a shopping tour. He begged her for the use of the car for a fishng party the next day. When she refused his request, he fidgeted angrily, 'accidentally' stepped on the accelerator and sent the car into a ditch, injuring both himself and his mother."

D. PSYCHONEUROTICS: Psychoneurotics are not likely to have accidents except when they are depressed or because of tension, tremors and fears. The psychoneurotic is a fearful, unhappy person, ill-adjusted to the stresses and strains of life. Inner conflicts and inability to meet the impacts of life lead to physical and mental symptoms such as worry, tension, introspection. I once referred to the psychoneurotic as a poet in the world of his viscera, a poet who hearkened to the splashes of his splanchnic waves. The inattention, the indecision, or the states of depression may contribute to accidents.

Accident Proneness

A STUDY of the literature on accidents leads to the conclusion that there are some individuals who are accident-prone, accident-addicted. Adler[5] reviewed the life stories of 130 workers who had repeated accidents, and found that many of them had anywhere from four to 36 accidents. Rawson[3] abstracted the statistics gathered by the National Research Council and by the Connecticut Bureau of Vehicles and came to the conclusion that a relatively small number of persons had a relatively large number of accidents. Whereas the large majority of drivers had no accidents at all, there were certain individuals who sustained from two to seven accidents each. The accident-prone individuals were accident-prone in many respects, at home as well as at work, in minor as well as in major collisions. We may refer once again to the study of Dunbar[4] which showed that in the past history of fracture patients, accidents were four times more numerous than in those who were hospitalized for cardiac disease. The accident-prone individual, according to Dunbar, gives the following personality profile: "He is likely to come from an unhappy, broken home. His health in childhood and adolescence was good and he was physically vigorous. He is an individual who loves action, machinery and daring. He is impulsive rather than deliberative. He resents authority and shows antagonism to control. He is unstable and therefore does not finish his courses in school, is casual in his social relations, and changes jobs often."

Menninger[9] cites the case history of an individual who is looked upon as a world's champion in the matter of accidents. Some of his traumatic experiences are as follows: At the age of four he fell off a horse and broke his arm; at the age of six he cut his left foot with a hatchet while trying to drive a stake into the ground; at seven he was gored by a bull. Later he fell from a freight train, suffering a fractured skull and the amputation of several toes. On another occasion he fell in a passenger car and broke a vertebra. Then again, two less serious injuries included a sprained ankle in a fall and a minor burn in an explosion. Despite his many accidents, this individual was considered quite cheerful. Menninger offers a theory for such accidents in his book, "Man against Himself": "Some individuals seem to fall victim to

successive disasters with an uncanny, sometimes almost incredible regularity. They are aggressive persons who are inclined to acts rather than fantasies. Often the accident serves to punish the individual for an inner sense of guilt. The accident or self-mutilation is in the nature of a ransom which protects the ego against the imposition of the death penalty." Melanie Klein offers a similar explanation: "Analysis of children has convinced me that such recurrent minor accidents and sometimes more serious ones are substitutes for self-inflicted injuries of a graver kind and may represent attempts at suicide with insufficient means." Adler,[5] in describing the makeup of those who have had repeated accidents, states: "Sixty per cent showed a bitter, resentful attitude towards their parents and educators, who were blamed by these workers for their unhappy lives. Their parents had forced them to take up an occupation they did not like. Now their parents could see what the outcome was. If they had been allowed to follow their original wishes, they wouldn't have become cripples . . . Their childhood was marked by difficulties in relation to school and relatives . . . One-third harbored serious ideas of suicide."

As an illustration, may I cite a composite case history: "A man who is of the impulsive, unstable type, whose childhood was unhappy because of a harsh father, whose schooling was interrupted and whose job record was irregular, obtained employment as a punch press operator in a factory. He felt that he was entitled to a more important position with better wages. He blamed his parents because he had not received more education. Each day, as he came to work, he was resentful toward the more successful employees and particularly toward the management. When he was put on the night shift, he was particularly displeased and showed a marked dislike for his foreman. One evening the foreman reprimanded him for several blunders the man had made. Our patient explained to me later that he barely controlled himself to keep from striking the foreman. He left his machine several times to take smokes and came back tense and angry. At one time he thought that he would like to break the machine. That night, quite accidentally, his finger was crushed.

It is apparent that this individual resented the authority, particularly the foreman, who was really a father-substitute. The fear and hostility toward the foreman is but a repetition of the resentment to all authority. When he was corrected, his first impulse was to quit or rather to strike. But an accident occurred which may not have been accidental at all. It served as an escape from drudgery, it served as a revenge against his employer, for the patient would now draw compensation. It also served as self-punishment for his own hostile thoughts. The psychologic factors in this case were borne out by the fact that, though this man had but a minor amputation of the one finger, he remained a disability problem for many years, during which time he would nurse his "painful hand." Adults are not entirely different from children who have a tendency to hurt themselves in lieu of hurting others. I know of one man who, when angered by his wife, will slap his own face instead of striking her.

Prevention and Treatment

THE occurrence of an accident requires treatment not alone for the injured part of the body but some consideration to the mind of the injured man. An employee who has had one accident may be treated surgically. If he has had two accidents, some investigation of his personality should be made. If he has had three accidents, he should be referred to a psychiatrist or discharged. In accidents which are man-made, it is important for the physician or the personnel director of a plant to look into the emotional reactions of the injured person before the accident as well as following the injury. This may enable a more correct prognosis and a quicker recovery.

From the standpoint of prevention, may I mention the following items:

A. PROVIDE FAVORABLE WORKING CONDITIONS IN THE PLANT: Smith[7] had mentioned the importance of good lighting, adequate ventilation, and proper temperatures both in improving efficiency and in lessening accidents. Good working conditions are even more important from the standpoint of lessening resentment and relieving nervous tension. Granted that some persons are impulsive and unstable and may invite injury, they are less likely to do so if the conditions in the plant are relatively favorable.

B. PREVENT FATIGUE: Fatigue will increase the accident rate which might arise from either organic or emotional causes. Smith[7] reported one study that showed that accidents were 2½ times as frequent when a 12-hour day was being worked as when the working day was reduced to 10 hours.

C. IMPROVE SKILL OF EMPLOYEES: Training of workers, graduated responsibility from safer to more hazardous jobs, and some educational program as to the nature of the work may help to lessen accidents. Once again may I quote from Smith[7] the observation that youth and inexperience are personal factors responsible for injury.

D. REASSIGNMENT: In the army it was found that certain soldiers who were nervous and jittery at one task became proficient and more capable when they were properly assigned. Thus the occurrence of an accident should invite a discussion of the relationship of the person to the particular task before him. Accident-prone individuals should be assigned to jobs where there is less accident liability. Rawson[3] stated that in one concern the accident rate was reduced to one-fifth by weeding out the accident-prone individuals from hazardous jobs.

E. PSYCHOLOGIC TESTS: Tests of coordination are being developed by psychologists which may become practical and enable a selection of individuals for particular jobs. Now that the war is over and employers may have a certain choice of employees, it may be advisable for large concerns to engage psychologists who will utilize existing tests or prepare special tests for the particular tasks involved. It should be good business as well as good public health for employers to engage phychologists on their staffs.

F. PSYCHIATRIC CARE: If the personnel director or the industrial physician recognizes some mental maladjustment, referral to a psychiatrist for more specialized study and treatment is advisable. The psychiatrist would then advise both the employer and the employee as to what steps are necessary to correct conflicts and personality problems that are responsible for accidents.

Conclusion

A STUDY of the subject of accidents leads to the inference that some are man-made. Disorders of the brain, disturbances of consciousness, diseases of the spinal cord lead to unsteadiness, inattention, lapses, which result in accidents. Commonly, however, man-made accidents are the result of emotional and mental problems. The malingerer, the psychopath, the depressed patient are apt to have accidents which serve

in an unconscious as well as in an objective way to provide a solution for inner conflicts and which serve as an escape to the individual, revenge against authority, and self-punishment. There are certain individuals who are accident-prone because of personality traits. Situations in industry may convert this tendency into the reality of an accident. Treatment and prevention are important to lessen the pain and cost and interruptions of such accidents. Improved working conditions as well as a consideration of the personality problems of the worker are helpful in prevention and treatment.

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Prolonged Observation on a Group of Arthritic Patients

HARVEY HORWITZ, M.D.,
and NORMAN R. JOSEPH, Ph.D.
—From the Departments of Medicine and Physiology and the Arthritis Clinic in the Research and Educational Hospitals, University of Illinois College of Medicine, Chicago—

THERE has been so much controversy about the treatment of arthritis with vitamin D, and so much misunderstanding of the implications of the treatment that it seems important to call attention again to the fact that this treatment was suggested by an empirical observation in 1933, when, in the course of an investigation on allergic patients, it was noted that arthritic patients included in the group under treatment with vitamin D, displayed sufficient improvement to appear to justify an investigation of its therapeutic possibilities. There was not then available commercially any preparation of vitamin D with sufficient potency to meet the requirements of the therapeutic regime instituted. The initial observations were continued for more than two years on a large number of patients before any publication was made.[1] Since 1933, a continuous program for the study of arthritis has been carried on in this institution, in which two considerations have been dominant:

(a) What is the underlying metabolic physiology of the arthritic subject?

(b) By virtue of what mechanism does any improvement in arthritic patients come about from vitamin D or any other form of therapy?

An early survey of literature indicated that the information available at that time was entirely inadequate on both questions. Some have been of the opinion that there was no possibility of improving the therapy for arthritis and that, therefore, nothing was to be gained by further research. Conservative opinion also was rather generally opposed to the conception of a general metabolic background especially for the rheumatoid type. Consequently, possible corrective therapy was directed at the local conditions about the affected joints. However, leading thinkers had clearly recognized the necessity for directing therapy toward general body metabolism, as well as alleviating local disturbances.

Since the initial publication on the use of vitamin D, there have been numerous clinical reports which have been reviewed.[1,2,3,4,5,6] Some have been excessively enthusiastic, ascribing to the treatment 100% favorable response, while others have reported no benefit whatever. Still other reviews purporting to be scientifically complete, have ignored all favorable evidence. There have been enough conservatively evaluated favorable reports by others, however, to justify further study in an effort to determine by what mechanism any form of vitamin D may influence favorably the general metabolic background of arthritis. That there is no rationale at present is freely acknowledged and *always has been.* On the other hand, favorable results from treatment with vitamin D were first observed *when no one anticipated any such response, or had any reason even to expect it might be beneficial in arthritis.*

The present report is based on the study of 102 unselected cases appearing in the Arthritis Clinic. As stated previously, treatment was not confined to any one form of therapy and a report based on the use of gold salts will be issued subsequently. The present report will be confined to those patients receiving electrically activated vaporized ergosterol.[x] On the basis of data to be published in detail later, it may be said that this consists of a mixture of unactivated ergosterol, calciferol and fairly large proportions of a vitamer D* which is not identifiable at present with any of the vitamers previously characterized by specific properties. There is no question of the presence of calciferol or vitamin D_2, but there is also no question any longer that this is not the only form; possibly, it is not even the most abundant one.

While the quantitative assay for toxicity of any vitamer D is not easily accomplished, there appears to be little doubt that this preparation is less toxic than ossiferol** or sedesterol.*** Steck et al[7] suggested a toxicity threshold of 20,000 units per kilo per day for viosterol. Because of the multiplicity of factors influencing clinical toxicity (Table I), there can be no very strict adherence to this figure, since toxic responses do appear occasionally at lower levels.

TABLE I.
FACTORS CONDITIONING TOXICITY TO VITAMIN D

1. Pre-existing physiological state.
2. Dose per unit of body weight.
3. Duration of administration.
4. Composition of diet—mineral and organic.
5. State of the alimentary tract.
6. Individual susceptibility.
7. Age of the subject.
8. Vehicle in which the vitamin is administered.
9. Route of administration.
10. Purity of the vitamin.
11. Source of the vitamin.
12. Functional state of the endocrine system.
13. Psychic suggestion by frequent reference to toxicity.
14. Failure to differentiate among:
    (a) Hypervitaminosis.
    (b) Hypercalcemia.
    (c) Toxication.

x—Ertron

* The term "vitamer" is used to differentiate individual members of a group of vitamins having a common action.

** The term ossiferol is suggested as a substitute for calciferol, a vitamin D_2, because the physiological implications of the term are more nearly in accord with the facts.

*** Sedesterol is suggested as a convenient term for activated 7-dehydrocholesterol or Vitamin D_3.

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The most common criticism of any form of therapy in arthritis is based on the criteria used in clinical evaluation. The existence of the psychogenic factors so clearly evaluated by Nissen,[8] by Patterson et al,[9] and by Farley, Spierling and Kraines,[10] compels the observer to adopt a very critical attitude toward any subjective evidence. And yet, it is very difficult to standardize objective criteria, either physical or chemical, for statistical treatment. Literally, thousands of laboratory observations have been recorded in the literature in an effort to characterize the metabolic state of the arthritic patient. Yet, the most careful statistical analysis of the data has not revealed any single test or group of related tests which can be considered pathognomonic of arthritis. In some quarters the sedimentation test has been accorded almost oracular prestige as an indicator of the degree of progress in the therapeutic response of arthritic patients. This point of view is poorly based when one considers the physicochemical factors involved in the test. These have been very carefully evaluated by Ham and Curtis.[11]

While there are no specific laboratory criteria available, it is, nevertheless, worth while to take account of general non-specific laboratory findings, especially in view of the ready inclination to criticize any report of therapy in arthritis which does *not* include such data.

All new patients admitted during the past 18 months (June, 1945) have, in addition to the complete history, thorough general physical examination and record of all previous therapy, been subjected to the following laboratory procedures: erythrocyte, leucocyte and differential counts, sedimentation, nonprotein nitrogen, uric acid, calcium, phosphorus, total blood protein, albumin-globulin ratio, cholesterol, blood chloride, Kahn test and blood adenylic acid, urinalyses (albumen, sugar, specific gravity microscopic) and regularly repeated roentgenological examinations. At monthly intervals weight, blood pressure and grip dynamometer readings were recorded. Whenever possible, the angular limits of mobility in affected joints were measured with graduated calipers. While discounting to a considerable degree the subjective evidence offered by the patients, nevertheless, all subjective evidence was recorded in full. Most of these data are not included in this report since there is no evidence of any changes that may be correlated with either the presence of arthritis or with the therapeutic response to any treatment. Consequently there is no point in taking up space to include such material in this report.

The vitamin D was administered orally in capsules, 50,000 units each. Weekly dosages ranged from 1,000,000 to 2,000,000 units. Gouty patients were instructed to take a low purine diet and obese patients a low caloric diet. All others were given a well balanced diet. In order to evaluate the psychogenic factor, patients were frequently given placeboes consisting of capsules of inert material identical in appearance with the active material.

Most patients tolerated well daily doses as high as 600,000 units. Toxicity was rare, although the rather characteristic combination of micturition, headache and nausea was noted occasionally, usually in the earlier stages of medication. In all instances, the symptoms disappeared when the dosage was reduced. Albuminuria was noted in only one case.

One patient who has been under continuous observation for 12 years has received not less than 200,000 units daily during that period except for brief intervals of therapeutic rest. Conservatively, it may be estimated that she has taken a total of one billion units. She is now 60 years old, in excellent general health and has never at any time complained of symptoms even remotely suggestive of toxicity.

In Table II is shown the distribution of the patients according to ages at the first interviews.

TABLE II.

Age	*Number of Cases*
Under 20	3
3rd decade	8
4th decade	15
5th decade	27
6th decade	29
7th decade	17
8th decade	3
	102

This distribution is about that found in any group of arthritic patients in a clinic. The classification by type and duration of dysfunction is shown in Table III. The distribution is not remarkable.

TABLE III.

	Rheumatoid	*Hypertrophic*	*Miscellaneous*
Under 1 yr.	8	4	2
1-5 yrs.	17	11	4
6-10 yrs.	16	10	1
11-15 yrs.	7	2	1
16-20 yrs.	5	2	1
Over 20 yrs.	6	5	0
	59	34	9

Seventy-nine patients in this group have come under observation in this clinic for the first time since November, 1943. The remaining 23 were receiving regular attention for varying periods previously, some since the initiation of the project (1933). One of the criticisms of the treatment of arthritis with vitamin D frequently expressed is that many patients require continuous treatment over a long period of time without measurable improvement. Aside from the fact that many other forms of therapy are in the same category in the sense that many arthritic patients have been obliged to continue on various forms of treatment throughout life, the criticism is invalid for this reason: whenever these patients have discontinued the use of vitamin D, either by personal choice, by physician's orders or by the use of a placebo, there has generally followed exacerbation. Therefore, in spite of the failure to improve, these may be considered as favorably influenced in the sense that retrogression was arrested markedly. In none of the 23 old patients did any other treatment applied at any time during the intervening 12 years accomplish anything more than static arrest. From the standpoint of therapeutic success in such cases, neither vitamin D nor any other therapy can be considered ideal. On the other hand, there can be no justification for failure to give the patients *that much* relief merely because complete success cannot be attained.

It should be pointed out, also, that most patients, at some time while under treatment will occasionaly display periods of exacerbation, usually ephemeral and of mild degree. Occasionally, these are relatively severe. This phenomenon occurs with any form of treatment and should not lead to misinterpretation of the overall response of the subject.

In their original paper, Dreyer and Reed[1] stated definitely that there was no implication in the use of vitamin D of D-deficiency in arthritis. Livingston[3] expressed the view that such was the case. We are unable to accept this. The long series of laboratory observations on these patients reported by Reed, Struck and Steck[2] clearly indicated that the action of vitamin D in greater than antirachitic dosage is strictly a pharmacological one.

Vitamin D is one of the few vitamins displaying a clearcut pharmacological action. This was recognized several years before it was employed in the treatment of arthritis, or any clinical condition except rickets. Otherwise, there could be no significant toxic effect, nor would it be of value as an antitetanic agent in parathyroid deficiency. The conception of vitamin D functioning through stimulation of the parathyroids is definitely outmoded.[12] This was an attractive hypothesis while it endured. That vitamin D can exert a pharmacological effect was not, then, a new idea, even as early as 1933. And yet, it has been difficult for most physicians to grasp this idea. One does not assume that digitalis or gold salts owe their therapeutic efficacy to their ability to compensate for a deficiency. Why, then, must we insist on evidence of D-deficiency in order for it to be effective as a therapeutic agent? It is not even necessary to assume any dysfunction of calcium-phosphorus metabolism although this might still be partly responsible. It is true that no laboratory test has confirmed the suggestion. It is also true that no laboratory test has yet been devised for application to clinical patients which will indicate all of the intricate relations of calcium and phosphorus in the mammalian body.

In Table IV are shown statistical analyses of the observations on the 79 new patients. Since the 23 old patients had been under observation for long periods, it appeared to be a more valid statistical procedure to separate the two groups. Table V is made up of data obtained from observations made on these during the same 18 months' period. From Table IV, it is seen that 15 patients out of 28, or 53%, and in the hypertrophic group showed no favorable response by any criteria. However, none showed improvement while on placeboes. In the rheumatoid group only 23% failed to respond with some definite evidence of improvement. In the miscellaneous group, 33⅓% showed no favorable response. One patient, a case of gonorrheal arthritis, showed definite improvement while under treatment with a placebo. Thus, a grand total of 49 patients, or 62%, showed some evidence of a response

TABLE IV.

Duration of Treatment	No.	Objective Improvement	Subjective Improvement	Placebo (improvement)	No Response
		HYPERTROPHIC			
Under 6 mos.	11	2	3	0	6
6-12 mos.	9	2	2	0	5
12-18 mos.	8	2	2	0	4
	28	6	7	0	15
		RHEUMATOID			
Under 6 mos.	20	6	9	0	5
6-12 mos.	16	7	4	0	5
12-18 mos.	6	3	1	0	2
	42	16	14	0	12
		MISCELLANEOUS			
Under 6 mos.	3	M	0	0	GcM
6-12 mos.	5	F	G Ep	G	F
12-18 mos.	1	0	F	0	0
	9	2	3	1	3
	79	24	24	1	30

F. —Fibromyositis Gc.—Gonorrheal arthritis G.—Gouty arthritis
Ep.—Epiphisitis M. —Mixed arthritis

TABLE V.
PATIENTS UNDER OBSERVATION OVER 18 MONTHS

	No.	Objective Improvement	Subjective Improvement	Placebo (improvement)	No Response
Hypertrophic	6	0	2	3	1
Rheumatoid	17	1	1	8	7
	23	1	3	11	8

TABLE VI.
GRIP DYNAMOMETER TEST IN POUNDS

	Hand	Initial	Final	Change	Treatment Interval
1	R	112	130	+ 18	14 mos.
	L	96	124	+ 28	
2	R	12	20	+ 8	18 mos.
	L	10	18	+ 8	
3	R	4	4	0	6 mos.
	L	16	12	− 4	
4	R	80	80	0	8 mos.
	L	95	94	− 1	
5	R	58	58	0	3 mos.
	L	50	50	0	
6	R	42	38	− 4	4 mos.
	L	28	28	0	
7	R	10	22	+ 12	6 mos.
	L	14	32	+ 18	
8	R	90	96	+ 6	9 mos.
	L	82	90	+ 8	
9	R	20	12	− 8	30 mos.
	L	28	20	− 8	
10	R	15	54	+ 39	12 mos.
	L	38	52	+ 14	
11	R	34	30	− 4	3 mos.
	L	28	34	+ 6	
12	R	50	40	− 10	8 mos.
	L	38	46	+ 8	
13	R	46	50	+ 4	6 mos.
	L	30	40	+ 10	
14	R	46	48	+ 2	5 mos.
	L	20	30	+ 10	
15	R	64	34	− 30	6 mos.
	L	56	48	− 8	
16	R	20	56	+ 36	6 mos.
	L	16	40	+ 24	
17	R	6	60	+ 54	4 mos.
	L	6	34	+ 28	
18	R	22	30	+ 8	8 mos.
	L	44	40	− 4	
19	R	30	70	+ 40	4 mos.
	L	35	36	− 1	
20	R	26	30	+ 4	4 mos.
	L	20	26	+ 6	
21	R	68	68	0	6 mos.
	L	50	60	+ 10	
22	R	30	34	+ 4	6 mos.
	L	30	22	− 8	
23	R	28	50	+ 22	8 mos.
	L	38	60	+ 22	
24	R	48	38	− 10	10 mos.
	L	62	60	− 2	
25	R	34	48	+ 14	3 mos.
	L	28	46	+ 18	
26	R	12	20	+ 8	12 mos.
	L	8	16	+ 8	
27	R	40	60	+ 20	6 mos.
	L	24	48	+ 24	
28	R	30	40	+ 10	12 mos.
	L	40	30	− 10	
29	R	6	8	+ 2	5 mos.
	L	8	8	0	
30	R	8	16	+ 8	12 mos.
	L	10	10	0	
31	R	68	68	0	13 mos.
	L	5	62	+ 12	
32	R	28	56	+ 28	14 mos.
	L	18	32	+ 14	
33	R	20	30	0	10 mos.
	L	38	24	− 14	
34	R	56	52	− 4	25 mos.
	L	36	42	+ 6	
35	R	62	70	+ 8	3 mos.
	L	40	50	+ 10	
36	R	30	40	+ 10	6 mos.
	L	22	30	+ 8	
37	R	56	72	+ 6	3 mos.
	L	54	66	+ 12	
38	R	20	20	0	2 mos.
	L	20	20	0	
39	R	68	96	+ 28	10 mos.
	L	60	90	+ 30	
40	R	24	24	0	12 mos.
	L	30	20	− 10	
41	R	30	44	+ 14	6 mos.
	L	30	46	+ 16	
42	R	36	60	+ 24	18 mos.
	L	28	60	+ 32	
43	R	12	16	+ 4	6 mos.
	L	4	2	− 2	
44	R	6	70	+ 60	6 mos.
	L	26	20	− 6	
45	R	20	54	+ 34	17 mos.
	L	18	30	+ 12	
46	R	40	28	− 12	7 mos.
	L	36	30	− 6	
47	R	48	42	− 6	3 mos.
	L	42	48	+ 6	
48	R	30	26	− 4	12 mos.
	L	54	40	− 14	
49	R	50	28	− 22	5 mos.
	L	50	56	+ 6	

TABLE VI—CONT.
GRIP DYNAMOMETER TEST IN POUNDS

	Hand	Initial	Final	Change	Treatment Interval
50	R	56	72	+ 16	7 mos.
	L	62	72	+ 10	
51	R	64	70	+ 6	9 mos.
	L	64	50	− 14	
52	R	8	10	+ 2	14 mos.
	L	10	10	0	
53	R	18	30	+ 12	12 mos.
	L	40	24	− 14	
54	R	68	82	+ 14	2 mos.
	L	70	70	0	
55	R	50	82	+ 32	3 mos.
	L	24	76	+ 52	
56	R	4	10	+ 6	12 mos.
	L	12	20	+ 8	
57	R	60	104	+ 44	4 mos.
	L	70	90	+ 20	
58	R	24	28	+ 4	10 mos.
	L	8	18	+ 4	
59	R	60	66	+ 6	12 mos.
	L	56	56	0	
60	R	32	48	+ 16	6 mos.
	L	80	44	− 36	
61	R	90	94	+ 4	6 mos.
	L	72	70	0	
62	R	38	22	− 16	1 mo.
	L	38	22	− 16	
63	R	54	44	− 10	6 mos.
	L	50	42	− 8	
64	R	22	30	+ 8	9 mos.
	L	12	30	+ 18	
65	R	4	10	+ 6	3 mos.
	L	12	18	+ 6	
66	R	16	28	+ 14	12 mos.
	L	16	40	− 24	
67	R	12	14	+ 2	12 mos.
	L	28	22	− 6	
68	R	44	40	− 4	15 mos.
	L	44	18	− 26	
69	R	38	50	+ 12	8 mos.
	L	40	46	+ 6	
70	R	60	64	+ 4	5 mos.
	L	50	56	+ 6	
71	R	4	8	+ 4	7 mos.
	L	4	8	+ 4	
72	R	58	41	+ 14	16 mos.
	L	40	50	+ 10	
73	R	0	12	+ 12	10 mos.
	L	8	14	+ 6	
74	R	24	12	− 12	6 mos.
	L	34	40	+ 6	
75	R	22	24	+ 2	6 mos.
	L	10	22	+ 12	
76	R	0	10	+ 10	3 mos.
	L	10	4	− 6	
77	R	34	24	− 10	8 mos.
	L	22	20	− 2	
78	R	30	22	− 8	12 mos.
	L	22	10	− 12	
79	R	36	30	− 6	12 mos.
	L	36	30	− 6	
80	R	24	50	+ 26	12 mos.
	L	20	50	+ 30	
81	R	24	36	+ 12	10 mos.
	L	20	20	0	
82	R	2	12	+ 10	5 mos.
	L	8	16	+ 8	
83	R	40	28	− 12	4 mos.
	L	44	28	− 16	
84	R	20	56	+ 36	3 mos.
	L	96	110	+ 14	
85	R	14	16	+ 2	2 mos.
	L	16	16	0	
86	R	33	30	− 3	2 mos.
	L	18	12	− 6	
87	R	90	110	+ 20	3 mos.
	L	100	100	0	
88	R	10	12	+ 2	3 mos.
	L	2	6	+ 4	
89	R	18	30	+ 12	8 mos.
	L	22	20	− 2	
90	R	40	36	− 4	2 mos.
	L	22	32	+ 10	
91	R	4	28	+ 24	2 mos.
	L	24	14	− 10	
92	R	40	60	+ 20	1 mo.
	L	58	60	+ 2	
93	R	26	32	+ 6	4 mos.
	L	30	48	+ 18	
94	R	16	28	+ 12	3 mos.
	L	0	0	0	

which was believed to represent something more than casual, spontaneous improvement. Many patients showed both subjective and objective improvement, but in the tables each was listed only once, in the column representing the most dominant phase of improvement.

It should be emphasized that the observations recorded in Table V were made during the same period of study as those recorded in Table IV, but on patients who had been under treatment already for months or years. Clinical records show that in some time during the previous periods of observation, all of these subjects had shown definite improvement when evaluated by the same criteria as employed in Table V. Yet nearly all of these older patients experienced exacerbations of considerable severity when active treatment was replaced by a placebo for any considerable period.

Subjectively, the most common response was relief from muscle and joint stiffness. Sometimes this could be confirmed objectively by the criteria described above. A feeling of "well-being" and a general tonic effect were also commonly noted. In contrast to the report by Freyberg[13] the rheumatoid group responded more favorably.

The fact that definite improvement does occur while under treatment with placeboes prompted us to adopt the policy of starting new patients on placeboes. Only one patient, not included in this study, showed any improvement during the initial period of placebo treatment which usually extended two to three months, at least. This one patient showed the following:

A colored female, 55 years old, entered the Clinic with marked pain, stiffness, tenderness and swelling of metacarpalphalangeal joints of both hands and general aching and stiffness. The rheumatoid arthritis was of three years' duration. The patient was placed on placebo capsules. The following month all swelling and tenderness subsided. The patient now has been on placeboes for six months without an exacerbation. She has no complaints—"feels fine." All swelling and stiffness has subsided. She has gained six pounds. Her grip readings improved from 12 to 34 in each hand.

The fact that such a phenomenon can occur in arthritis serves to emphasize the extreme caution necessary in evaluating therapy. The fact that other patients did not react in this manner lends confidence to our belief that it is possible to avoid too extreme misjudgments about the results of any therapy in arthritis, provided one devotes enough care and attention and can personally examine every patient at frequent intervals.

Out of the new patients, 59 gained weight, 28 lost insignificantly, the others remained stationary. The greatest loss by any one patient was 11 pounds. This appears to be nothing more than an adjustment and stabilization of nutrition to a new tempo.

In Table VI are shown the results of the tests with the grip dynamometer. Only 94 patients received this test. The test was not applied frequently enough for the element of training to account for the results. Besides, it was not uncommon for one hand to improve while the other decreased in grip power. There appeared to be three important limiting factors: (a) muscle power per se, (b) pain, and (c) mechanical limitation of joint mobility by ankyloses, exostoses and swelling. There were 40 patients who showed definite improvement in both hands; 27 showed improvement in one hand only with either loss or no change in the other, while 26 showed losses, or no change in both hands. In the eight cases omitted from this table, there was no involvement of the hands.

There have been some reports on the experimental production of hypertension in animals from which has developed fear that hypervitaminosis D might be a responsible factor in human hypertension. This has been discussed extensively[2] and the conclusion reached that human hypertension does not occur at

any dosage range of vitamin D recommended for clinical application. Also, several recent publications[14,15] have not confirmed the experimental results on animals reported earlier. Nevertheless, frequent blood pressure readings have been made on all of our patients. A detailed report will be made in another paper, but it may be stated here that approximately one-third of the entire group showed systolic pressures increased mildly and a slightly lower proportion a statistically insignificant increase in diastolic pressure. These two groups were not coexistent, however, the overlap being about half of each group.

Approximately the same situation existed with regard to decreasing systolic and diastolic pressures. The remaining one-third showed no sustained variations. Both increases and decreases occurred on placebo treatment so that it would be difficult to conclude that either change resulted directly from the vitamin.

It is a common belief that long continued administration of vitamin D over a period of time, even in moderate dosage, will promote the development of metastatic calcification. Flat plate roentgenograms of the abdomen did not reveal any evidence of metastatic calcification, although some had been on the treatment as long as 10 years.

During recent years Van Wagtendonk and his collaborators[16] have reported a long series of investigations on a fat-soluble essential dietary factor, absence of which causes joint stiffness in guinea pigs not unlike the fibromyositis so frequently encountered along with arthritis. Despite reports by others[17] of failure to duplicate the results, there still appears to be some merit in this conception and it should be given clinical trial.

TABLE VII.
BLOOD ADENYLIC ACID-NITROGEN MGM. PER 100 CC.

	Pretreatment Period		Days	After Treatment with Vitamin D	Days	Change
H L	6.04, 6.13 } 6.085		7	6.32, 6.18, 6.26, 6.19 } 6.24	118	+0.16
N R	6.36			6.26, 6.34 } 6.30	16	−0.06
M H	6.26			6.47, 6.39 } 6.43	28	+0.17
E H	6.36			6.57, 6.39 } 6.48	35	+0.12
C C	6.60			6.60		....
G P	6.35			6.38		+0.03
R S	6.93			6.86, 6.95 } 6.90	105	−0.03
E B	6.76			6.88		+0.12
M M	6.42					
E C	6.54					
C Cl	6.88	F N				
K T	6.46	A I				
				6.11		
				5.86, 6.09 } 5.98	141	

Since this factor appears to be so intimately related to the metabolism of phosphorus, it seemed worthwhile to examine the adenylic acid content in the blood. The method of Kerr and Blish[18] was used. In Table VII are shown the results obtained on a few patients. From the data, it is apparent that the adenylic acid content of the blood is not affected significantly, either by the presence of arthritis or by the treatment, although there is a small, fairly consistent trend upward after treatment has been continued for some time.

In their classical monograph on the pathology of the articular structures in the knee joint, Bennett, Waine and Bauer[19] have brought up to date the accumulated data relative to the structural changes occurring in the joints in degenerative dystrophies, while Bauer, Ropes and Waine[20] reviewed the literature on the physiology of articular structures and came to the conclusion that synovial fluid is a tissue fluid and that the synovial cavity is a connective tissue space.

Bayles, Richardson and Hall[21] investigated the dietary background of rheumatoid arthritics and concluded that there is a factor of suboptimal nutrition when the organism is unable to meet periods of stress.

This point was even more strongly emphasized by Peete[22] who believed that while dietary deficiency is not specific, it is an important factor in poor resistance to infection in the onset of rheumatic fever.

Seltzer[23] has presented an exhaustive analysis of the anthropometric relations of the two main types of arthritis, indicating that there is an important constitutional difference between the two groups. Goldberg[24] concurred in this conclusion and suggested that the simultaneous occurrence of the two great types in the same subject might be due to the difference in the age incidence of the two. It is doubtful, however, if the age differentiation is sufficiently distinctive. Stone[25] has further emphasized the neuroendocrine metabolic aspects of the arthritic states.

That rheumatoid arthritis involves structures far removed from affected joints has been demonstrated by Freund and his collaborators[26] in the finding of nodular lesions in both nerves and muscles. Further emphasis is laid on the systemic or metabolic involvement by the work of Selye et al[27] who produced experimental arthritis in animals by overdosage with desoxycorticosterone. The general physiological aspects of rheumatoid conditions have been reviewed by Wright.[31] There appears, thus, to be abundant, if indirect, justification for the concept of the systemic background of arthritis to which we have adhered.

However, this concept cannot overbalance the fact that severe local disturbances *do* occur and one must, then, look for mechanisms whereby the general systemic influences impinge upon the synovial fluid and the articular cartilages. The literature carries reference to many such efforts. Goldberg[24] has presented evidence that the initial change in the articular cartilage is a shift in pH to the alkaline side. This possibility is being investigated here with a new electrode recently described by Joseph and Homburger.[28] Hubbard and Porter[29] have recently demonstrated the presence of powerful glycolytic enzymes in the synovial fluid. More recently, Davies[30] has reported on a systematic study of synovial fluid from several joints in cattle, from which he concluded that there are significant variations in composition, particularly in its protein content, among different joints in the same animals. He also argued that, due to its nutritive function, the volume of fluid in any joint is in excess of lubricating requirements.

The presence in synovial fluid of a complex polysaccharide, hyaluronic acid,[32] has stimulated a great deal of interest in its buffering capacity and in its influence on the viscosity of synovial fluid. This problem is under active investigation both in the human and in experimental animals.[33] The intricate metabolism of bone also is being re-examined by newer methods with a view to possible better understanding of the nature of the involvement of the skeletal structures in arthritis.

Summary

OBSERVATIONS are reported on 102 unselected cases of arthritis appearing in the Arthritis Clinic who were treated with massive doses of vitamin D in the form of Ertron.

2. Both subjective responses and objective results were recorded.

3. The most common favorable results were alleviation of muscle and joint stiffness and a general tonic effect.

4. This is a relatively safe therapeutic measure, as the potential dangers have been greatly overstressed.

5. Laboratory procedures in general are of little value as criteria of progress.

6. Subjective evidence must be evaluated with *extreme caution.*

7. The adenylic acid content of the blood is unaffected by the disease process as well as by the therapy employed.

8. Blood pressure, likewise, is unaffected by prolonged administration of vitamin D.

9. Any therapeutic regime for arthritis should be continued over a period of years in order to be properly evaluated.

10. Arthritis must always be considered from the point of view of its effects on muscles, nerves, fluids, tendon sheaths, as well as of the affected joints.

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A Study of Handicaps in Industry

CAPT. SIDNEY G. OHLHAUSEN,
Houston, Texas

EVEN before her own entrance into World War II, the United States had committed herself to being the "arsenal of democracy." This portentous committment naturally created innumerable problems, one of the greatest of which was to find adequate manpower. Somehow, sufficient personnel had to be found to man the greatest industrial program in history. Moreover, it was requisite that the cream of manpower would be siphoned off for the armed forces. Thus, there were only two substantial residues of potential manpower: women and handicaps. The victory of the Allies is sufficient proof of the efficacy of these "new recruits." It is with the efficiency of the second group that this paper is concerned.

In the early days of the war, the term "handicaps" was seldom used by industrial physicians. At that time they simply "lowered physical requirements" in order to secure more personnel. Actually, these medical examiners were accepting handicaps. A more complete definition of handicaps is suggested as follows: A handicapped employee is one who has one or more physical defects which are permanent or semi-permanent, particularly if these defects might limit him from doing *any* type of work or might obviously affect his efficiency if he did just any type of work. For instance, a color-blind electrician might not ordinarily be considered handicapped, but he might experience considerable difficulty in matching multi-colored connecting wires on a complex B-29 airplane. On one occasion the author found a parachute inspector whose best corrected far vision was 20/200 bilateral and who could not read Jeager 2 at any distance with his correction. These individuals were handicapped as far as their job-efficiency was concerned.

With the above definition of a handicap in mind, a practical system of classification was devised. The basic units of this classification are anatomical systems, namely, sensory, circulatory, etc. The first subclassifications are principally functional, namely, vision, auditory, amputations, etc. Other sub-classifications are utilized for detailed study. The complete classification is outlined in Table No. I. However, some conditions which were thought to be handicapping were found to be innocuous as far as physical efficiency was concerned. These conditions were retained in Table No. I for the sake of record. By using this handicap classification it was possible to accumulate statistics which might give some insight to the relative value of the individual handicap. It has been contended by some that handicaps are better workers than normal individuals. This contention is subject to considerable dispute unless there is, first, agreement as to the definition of handicap, and, second, the exact functional kind of handicap in question is stated. Table No. I attempts to settle the controversy. It should be emphasized, however, that many individuals

have multiple handicaps. This fact was necessarily disregarded in the preparation of Table I.

In Table I handicaps are compared with non-handicaps on the basis of sick-absenteeism and "on-the-job" accidents. The statistics in this table are based on sick-absenteeism and accident data at the Middletown Air Depot from the period of July 1, 1944, to June 30, 1945, inclusive. This particular year was selected because it was the first year in which accurate figures were available. All employees who did not work the entire period were eliminated. It should be stated that the depot is principally concerned with the maintenance and supply of aircraft.

In order to insure accuracy of classification, certain criteria of diagnoses of each handicap were devised as follows:

1. *Illiteracy:* Inability to read and write English.

2. *Defective Far Vision:* Inability to read from 20/50 to 20/400 without correction.

3. *Defective Near Vision:* Inability to read Jeager 2 at any distance without correction.

4. *Blindness, bilateral:* Inability of either eye to read 20/400 or better with correction.

5. *Blindness, unilateral:* Inability of one eye to read 20/400 or better with correction.

6. *Dyschromatopsia:* Inperfect color vision according to AOC.

7. *Nystagmus-Strabismus:* Presence of gross nystagmus or strabismus.

8. *Miscellaneous Diseases and Injuries of the Eye:* Self-explanatory.

9. *Deafness, total:* Inability to hear coin click at any distance.

10. *Deafness, partial:* Inability to hear better than 15/20 in either ear (coin click).

11. *Mechanism Disturbances:* Any irregularity of the heart rhythm.

12. *Coronary Diseases:* History of typical angina syndrome; positive EKG; history of typical attack of coronary thrombosis.

13. *Myocarditis and Pericarditis:* Any organic heart diseases not included in other classifications.

14. *Congenital Heart Disease:* Credible history of congenital heart disease together with suggestive physical or x-ray findings.

15. *Valvular Heart Disease:* Any diastolic murmur; any systolic murmur not obviously functional.

16. *Aortitis:* Enlargement of the aorta as visualized by x-ray.

17. *Hypertension:* Blood pressure

TABLE I.

STATISTICAL DATA ON SICK-ABSENTEEISM AT MIDDLETOWN AIR PORT FOR PERIOD JULY 1, 1944, TO JUNE 30, 1945, INCLUSIVE

	On-the-Job Accidents					Average per Employees		Percentages	
	Number of Accidents	Percent of Total Accidents	Number Employees	Times Absent	Days Absent	Times Absent	Days Absent	of Total Employees	of Total Man Days Lost
All Employees	57	100.00	9,405	27,556	80,911	2.9	8.6	100.00	100.00
Non-Handicapped	18	31.58	5,462	15,248	39,548	2.7	7.2	56.81	47.52
Handicapped	39	68.42	3,943	12,308	41,363	3.1	10.4	43.19	52.48
Sensory	16	28.07	1,613	4,839	15,261	3.0	9.4	17.15	18.86
Vision	12	21.05	1,429	4,370	13,535	3.0	9.4	15.19	16.96
Illiteracy	0	0	14	26	106	1.8	7.5	0.15	0.13
Refractive Errors	9	15.79	1,273	3,937	12,237	3.0	9.6	13.34	15.12
Defective Far Vision	9	15.79	768	2,576	7,060	3.3	9.1	8.17	8.72
20/50	—	—	134	415	1,258	3.0	9.4	1.42	1.55
20/70	—	—	135	444	1,057	3.3	7.8	1.43	1.31
20/100	—	—	141	447	1,305	3.2	9.3	1.50	1.61
20/200	—	—	156	559	1,328	3.6	8.5	1.66	1.64
20/400	—	—	19	32	118	1.7	6.2	0.20	0.15
Unclas.	—	—	183	679	1,994	3.7	10.9	1.95	2.46
Defective Near Vision	0	0	118	251	1,078	2.1	9.1	1.26	1.34
Defective Near and Far Vision	0	0	387	1,110	4,099	2.9	10.6	4.12	5.07
Bilateral Blindness	0	0	4	16	23	4.0	5.8	0.04	0.03
Unilateral Blindness	1	1.75	58	175	497	3.0	8.6	0.62	0.61
Dyschronatopsia	0	0	35	82	230	2.3	6.6	0.37	0.28
Nystagmus & Strabimus	1	1.75	24	72	190	3.0	7.9	0.26	0.23
Cataracts & Aphakia	0	0	17	53	246	3.1	14.5	0.18	0.30
Aphakia	0	0	17	53	246	3.1	14.5	0.18	0.30
Miscellaneous Diseases & Injuries of the Eye	1	1.75	4	9	6	2.3	1.6	0.04	0.01
Auditory	4	7.02	184	469	1,726	2.5	9.4	1.96	2.13
Total Deafness	0	0	1	5	4	5.0	4.0	0.01	0.00
Partial Deafness	4	7.02	183	464	1,722	2.5	9.4	1.95	2.13
Orthopedic	8	14.04	897	2,610	8,866	2.9	9.9	9.54	10.95
Amputation	2	3.51	135	394	1,165	2.9	8.6	1.43	1.43
Fingers	2	3.51	82	246	683	3.0	8.3	0.87	0.84
Hands	0	0	6	18	64	3.0	10.7	0.06	0.08
Forearms	0	0	4	4	12	1.0	3.0	0.04	0.01
Arms	0	0	9	18	45	2.0	5.0	0.10	0.06
Toes	0	0	5	6	13	1.2	2.6	0.05	0.02
Feet	0	0	1	5	25	5.0	25.0	0.01	0.03
Leg	0	0	19	58	218	3.1	11.5	0.20	0.27
Thigh	0	0	7	39	105	5.6	15.0	0.07	0.13
Pes Planus	0	0	159	417	1,331	2.6	8.4	1.69	1.64
Hernias	2	3.51	206	540	2,017	2.6	9.8	2.19	2.49
Spinal Deformities	0	0	56	144	406	2.6	7.3	0.60	0.50
Hydrocoele	0	0	16	20	89	1.3	5.6	0.17	0.11
Osteomyelitis	0	0	28	42	349	5.1	12.5	0.30	0.43
Fractures	0	0	46	112	465	2.4	10.1	0.49	0.57
Anterior Polionelitis	0	0	34	137	363	4.0	10.7	0.36	0.45
Burn Scars	0	0	6	20	93	3.3	15.5	0.06	0.11
Gunshot Wounds	1	1.75	19	62	197	3.3	10.4	0.20	0.24
Tuberculosis of Bone	0	0	4	14	32	3.5	8.0	0.04	0.40
Miscellaneous Diseases & Injuries	0	0	13	42	133	3.2	10.2	0.14	0.16
Arthritis	3	5.26	123	416	1,768	3.4	14.6	1.31	2.18
Congenital Deformities	0	0	52	170	459	3.3	8.8	0.55	0.57
Feet	0	0	17	40	89	2.4	5.2	0.18	0.11
Bones	1	1.75	30	95	337	3.2	11.2	0.32	0.42
Miscellaneous	0	0	5	35	33	7.0	6.6	0.05	0.04
Circulatory	12	21.05	874	2,528	9,577	2.9	11.0	9.29	11.36
Cardiac	3	5.26	251	755	2,601	3.0	10.4	2.67	3.21

TABLE I.
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	On-the-Job Accidents					Average per Employees		Percentages	
	Number of Accidents	Percent of Total Accidents	Number Employees	Times Absent	Days Absent	Times Absent	Days Absent	of Total Employees	of Total Man Days Lost
Mechanism Disturbances	0	0	22	69	322	3.1	14.6	0.23	0.40
Coronary Diseases	0	0	11	35	179	3.2	16.3	0.12	0.22
Myocarditis & Pericarditis	0	0	53	154	543	2.9	10.2	0.56	0.67
Congenital Heart Disease	1	1.75	5	10	15	2.0	3.0	0.05	0.02
Valvular Heart Disease	2	3.51	160	487	1,542	3.0	9.6	1.70	1.90
Arterial	4	7.02	351	982	4,019	2.8	11.5	3.73	4.96
Aortitis	0	0	50	141	506	2.8	10.1	0.53	0.63
Arteriosclerosis	1	1.75	34	93	381	2.7	11.2	0.36	0.47
Hypertension	3	5.26	267	784	3,132	2.8	11.7	2.84	3.87
Venous	5	8.77	272	771	2,957	2.8	10.9	2.89	3.65
Varicose Veins	4	7.02	217	648	2,523	3.0	11.6	2.31	3.11
Variocoele	1	1.75	36	80	291	2.2	8.1	0.38	0.36
Hemorrhoids	0	0	19	43	143	2.3	7.5	0.20	0.20
Respiratory	0	0	331	821	2,865	2.5	8.7	3.52	3.54
Upper Respiratory Diseases	0	0	6	27	56	4.5	9.3	0.06	0.07
Pulmonary	0	0	271	794	2,809	2.9	10.4	2.88	3.47
Asthma	0	0	37	159	576	4.3	15.6	0.39	0.71
Silicosis	0	0	67	148	670	2.2	10.0	0.71	0.83
Chronic Diseases	0	0	18	67	165	3.7	9.2	0.19	0.20
Tuberculosis	0	0	149	420	1,448	2.8	9.7	1.58	1.78
Primary & Hilar	0	0	58	136	429	2.3	7.4	0.62	0.53
Doubtful Activity	0	0	84	260	942	3.1	11.2	0.89	1.16
Miliary	0	0	2	5	12	2.5	6.0	0.02	0.01
Advanced	0	0	5	19	65	3.8	13.0	0.05	0.08
Ailmentary	0	0	37	142	506	3.8	13.7	0.39	0.63
Gastro-Duodenal Ulcers	0	0	23	70	299	3.0	13.0	0.24	0.37
Miscellaneous Diseases	0	0	14	72	207	5.1	14.8	0.15	0.26
Genito-Urinary	1	1.75	229	854	2,493	3.7	10.9	2.43	3.08
Lues	1	1.75	176	677	1,812	3.8	10.3	1.87	2.23
Kidney Disorders	0	0	33	124	472	3.8	14.3	0.35	0.58
Female Disorders	0	0	2	9	11	4.5	5.5	0.02	0.01
Male Disorders	0	0	18	44	198	2.4	11.0	0.19	0.24
Neuro-Psychiatric	1	1.75	60	161	569	2.7	9.5	0.64	0.70
Epilepsy	1	1.75	11	27	48	2.5	4.4	0.12	0.06
Neurological	0	0	49	134	521	2.7	10.6	0.52	0.64
Endocrine	0	0	69	280	889	4.1	12.9	0.73	1.10
Thyroid	0	0	33	140	382	3.9	11.6	0.35	0.47
Diabetes	0	0	36	140	507	3.9	14.1	0.38	0.63
Tumors	0	0	9	28	134	3.1	14.9	0.10	0.17
Dermatological Diseases	0	0	7	18	103	2.6	14.7	0.07	0.13
Industrial Diseases	0	0	10	27	100	2.7	10.0	0.11	0.12

of 165/90 or higher (re-checked) at one examination.

18. *Varicose Veins:* Varicose veins of any degree on the lower extremities.

19. *Varicocoele:* Any varicocoele larger than a pecan.

20. *Hemorrhoids:* Any degree, internal or external, symptomatic or asymptomatic.

21. *Upper Respiratory Diseases:* History of chronic sinusitis; seasonal hay fever, etc.

22. *Asthma:* History of persistent seasonal asthma or presence of loud sibilant rales, bilateral.

23. *Silicosis:* X-ray diagnosis of any degree of silicosis.

24. *Primary and Hilar Tuberculosis:* X-ray findings of definitely healed primary or hilar lesion.

25. *Doubtfully Active Tuberculosis:* Any x-ray diagnosis of tuberculosis when there is the slightest doubt of activity.

26. *Miliary Tuberculosis:* X-ray diagnosis.

27. *Advanced Tuberculosis:* X-ray diagnosis.

28. *Chronic Pulmonary Diseases:* Any chronic pulmonary disease not included in the above classification.

29. *Gastro-duodenal Ulcers:* History of positive x-ray diagnosis of gastric or duodenal ulcer.

30. *Miscellaneous Alimentary Diseases:* Any chronic gastro-intestinal or allied disease other than ulcers.

31. *Amputation, fingers:* Any amputation distal to the metacarpo-phalangeal joints.

32. *Amputation, hands:* Any amputation distal to the wrist but proximal to the metacarpo-phalangeal joints.

33. *Amputation, forearms:* Any amputation between the elbow and wrist.

34. *Amputation, arms:* Any amputation between the shoulder and the elbow.

35. *Amputation, toes:* Any amputation distal to the metatarso-phalangeal joints.

36. *Amputation, feet:* Any amputation between the tibio-calcaneal joint and the metatarso-phalangeal joints.

37. *Amputation, legs:* Any amputation between the knee and ankle joints.

38. *Amputation, thigh:* Any amputation between the hip and knee joints.

39. *Pes planus:* Any degree of pes planus, symptomatic or asymptomatic.

40. *Congenital Deformity, feet:* Pes cavus; telipes; hallus valgus (not a congenital deformity, of course.)

41. *Congenital Deformity, bone:* Any congenital deformity by x-ray or physical examination of any bones other than those in the feet.

42. *Congenital Deformity, miscellaneous:* Any congenital deformity not included in previous handicaps.

43. *Hernias:* Any complete hernia.

44. *Spinal Deformities:* Any moderate or severe scoliosis; kyphosis; lordosis; spondylolisthesis; bifida, etc.

45. *Hydrocoele:* Any size hydrocoele the diagnosis of which is confirmed by transillumination.

46. *Osteomyelitis:* Any history with appropriate physical findings of osteomyelitis, active or healed.

47. *Fractures:* Any fracture producing definite permanent deformity.

48. *Anterior Poliomyelitis:* Any degree of residual muscular atrophy following a history of anterior poliomyelitis.

TABLE II.
ANALYSIS OF SUB-NORMAL AND EXCESSIVE SICK-ABSENTEEISM
BASED ON
SICK-ABSENTEEISM OF HANDICAPS
AS GIVEN IN TABLE I.

	Number of Employees	Days Absent	Percentage of Total Employees	Percentage of Total Man Days Lost
Employees Absent *Over* the Average Annual Rate				
A fraction of one day or more than one day over	3,140	34,173	33.38	42.20
One or more days over	2,380	27,047	25.30	37.40
Two " " " "	1,740	20,604	18.50	25.40
Three " " " "	896	11,487	9.53	14.10
Four " " " "	351	5,101	3.73	6.30
Five " " " "	323	4,737	3.43	5.85
Six " " " "	114	1,744	1.21	2.15
Seven " " " "	49	780	0.52	0.96
Eight " " " "	1	25	0.01	0.03
Employees Absent Average Days Per Annum	58	497	0.62	0.61
Emp loyees Absent *Less* Than Average Annual Rate				
Seven or more days less than average	4	6	0.04	0.07
Six " " " " " "	9	21	0.09	0.03
Five " " " " " "	18	46	0.19	0.06
Four " " " " " "	30	98	0.32	0.12
Three " " " " " "	74	332	0.79	0.41
Two " " " " " "	139	748	1.48	0.92
One " " " " " "	286	1,832	3.04	2.26
A fraction of one day or more than one day less	882	6,744	9.38	8.33

49. *Burn Scars:* Any extensive burn scars.

50. *Gun Shot Wounds:* Any injury with a history of such injury being caused by shrapnel, buck shot, bullet, or bayonet.

51. *Tuberculosis of Bone:* History of tuberculosis of bone with appropriate physical findings.

52. *Miscellaneous Orthopedic Diseases and Injuries:* Any permanent or semi-permanent disease or injury not included in any other classification.

53. *Arthritis:* A positive finding by physical examination or x-ray, chronic or acute recurrent arthritis or ankylosis.

54. *Lues:* Any positive serology of 3 plus or 4 plus regardless of history and physical findings, or any positive serology of 1 plus or 2 plus with suggestive history or physical findings.

55. *Kidney Disorders:* Any chronic kidney disease as evidenced by definite physical or laboratory findings.

56. *Female Disorders:* This classification was included for the sake of completeness, but is unsatisfactory from the industrial physician's standpoint as pelvic examinations are not practical.

57. *Male Disorders:* Any chronic disease or congenital deformity of the male pelvic organs.

58. *Epilepsy:* Any history of epilepsy or personal observation of a single attack.

59. *Neurological:* Any disease of the nervous system manifested by definite physical findings other than epilepsy.

60. *Thyroid:* Any enlargement of the thyroid gland.

61. *Diabetes:* Persistent urinary sugar and/or history of treatment by insulin.

62. *Tumors:* Roughly, any tumor anywhere larger than a pecan.

63. *Dermatological Conditions:* Any chronic skin disease including epidermal carcinoma.

64. *Industrial Diseases:* Positive evidence of the presence of any industrial disease or sensitivity to industrial poisons.

NO ATTEMPT is being made to revolutionize diagnostic medicine as might be facetiously assumed from the above criteria. One must remember that the examining industrial physician is forced to make "snap diagnoses," because of lack of time. One should consider in the interpretation of Table I that each handicapped person was assigned in accordance with his physical limitations and was restricted from doing any type of work which would aggravate his condition in any way.

Perhaps psychoneuroses should be included in the classification; they were omitted here because accurate diagnoses are too difficult to make on a pre-employment examination in the time ordinarily allotted for this.

Table II is an analysis of Table I to show what man-day losses and gains might be anticipated if certain types of handicaps are employed. A study of Table II will reveal that by substituting those 9.83% of employees (whose sick-absentee rate is sub-normal) for 9.53% of employees (whose sick-absentee rate is excessive) there would be a decrease of approximately 5½% total sick-absenteeism. A further study of the Table will reveal possible reductions of even greater percentages.

Summary

INDUSTRY was forced to use large numbers of handicapped individuals during the war. The original purpose of this paper was to attempt to find out if we had any factual evidence either pro or con in regards to the prospective use of handicaps in the postwar era. It is believed that this paper does give some insight as to the relative value of various handicaps. It is therefore suggested that (1) the definition of handicap be further refined; (2) that a functional classification of handicap be set up as a standard for all industrial physicians; (3) that further statistics on handicaps be published.

Conclusions

HANDICAPS as herein defined are probably undesirable employees in large industries; i.e., handicaps comprise only 43.19% of all employees, but they account for 52.48% of total man days lost and 68.42% of total accidents. However, some handicaps appear to be excellent workers; viz., arm amputees, comprising 0.1% of all employees used only 0.06% of total sick leave and had 0.00% of accidents. Other handicaps seem particularly undesirable; viz., partial deafness comprising 1.95% of total personnel are responsible for 2.13% of total sick-absenteeism and 7.02% of total accidents. Arthritis comprising 1.31% of total personnel are responsible for 2.18% of total sick-absenteeism and 5.26% of total accidents, etc.

Proper statistics on handicaps will give the industrial physician positive clues on the incidence of physical defects on which to base the physical requirement for employment in his plant. It will also give him information as to means of reducing sick-absenteeism and accidents.

It does not necessarily follow that those handicaps who are undesirable in large industrial plants will be undesirable in small shops. However, it is cautioned that indiscriminate hiring of handicaps by large industries in the immediate postwar era with consequent poor results might irrevocably destroy their opportunity with smaller shops in the more distant future.

The Traumatic Neuroses of Industry

JOSEPH BIERNOFF, M.D.,
San Francisco, California

THE problems of the industrial psychiatrist differ in that the environmental factors represented by the work situation are of great importance. What makes the practice of the industrial psychiatrist differ from that of the psychiatrist in private practice is the traumatic neuroses of industry. A traumatic neurosis is a defense of the individual to a physical threat to his body, and it is characterized primarily by withdrawal from the external world which is the source of the threat, inhibition of activities, and anxiety symptoms. This is the nucleus of the traumatic neurosis. Surrounding it there may be other symptoms. The compensation neurosis is a type of traumatic neurosis in which the secondary gain from compensation plays an important or even major role. In studying a patient involved in an accident and showing symptoms of a neurosis many variables must be considered. The individual is the product of his endowment at birth, his childhood conditioning, his reaction to his adult situation and specifically to the traumatic incident. All these factors must be evaluated. Childhood factors will influence the character type and neurotic tendencies in an individual. The environmental situation prior to the trauma may be of great importance in the formation of the neurosis. The trauma itself and the conditions under which it is suffered, the state of fatigue, the psychological tension at the time of injury influence the result, and after the injury the secondary gains may determine whether recovery from the traumatic neurosis is rapid or slow.

What are the psychological dynamics of the traumatic neurosis? What is the pure traumatic neurosis uninfluenced by the admixtures of character, and neurotic factors? The traumatic neurosis may occur in anyone, and a mild, shortlived neurosis may be considered normal. We suffer an injury, a cut of the finger or narrowly escaped automobile accident. It is a threat to our physical self. We feel a sense of fear and insecurity, a consciousness of the dangers lurking in the outside world. We have a desire to avoid this threatening world, to escape to a safe haven. We also feel the ordinary somatic concomitants of fear. These vary from individual to individual and may consist of one or more of the following: trembling, sweating, pallor, dryness of the mouth, speechlessness, immobility, tachycardia, irregularities of rhythm, a sensation of pressure over the chest, increase in depth and rapidity of breathing, changes in blood pressure, changes in the mobility and secretion of the gastrointestinal tract, frequency in urination, changes in the blood supply to various parts of the body, a feeling of confusion and diminution of consciousness, exhaustion and ease of tire. In the average individual this feeling passes rapidly. He returns to the world of reality and finds it as before. There has been no permanent change in the structure of his ego. He does not have the feeling that there has been a change in external reality. In the traumatic neurosis this feeling does not pass away. The ego is more or less permanently altered. Outside reality seems to have changed, to have become more threatening, a consciousness of the dangerous physical forces in the world becomes more acute, the body ego becomes more sensitive, withdraws and wishes to avoid contact with this changed world of danger. The ego becomes more sensitive to the threat of danger and develops anxiety more easily when confronted with it. Personality becomes re-oriented to avoid the dangers. Eventually the original purpose of the personality change to avoid or be prepared for injury is lost sight of, and a superimposed character change results. The individual becomes restricted in his activities, his ego shrinks, he develops defenses against contact with the world, he wishes to become a child again dependent on the mother. He may even be in a constant state of anxiety because the ordinary hazards of living present themselves as a threat to him. We must remember that we are dealing here with the dynamics of the traumatic neurosis. The defenses built up pertain to the particular trauma suffered at the time of the accident and due to a particular injury or threat. They condition a patient to react to the external world with avoidance at least to certain things.

Freud, in "Beyond the Pleasure Principle" (p. 10), states regarding the traumatic neuroses: "The patient has, so to speak, undergone a physical fixation as to the trauma. Fixation of this kind on the experience which has brought about the malady has long been known to us in connection with hysteria."

Thus a single psychic trauma may bear the same relation to the traumatic neurosis as a single trauma in the genesis of hysteria or phobias. The difference is that in one the threat is to the ego instinct; and in the other the threat is to the sexual instincts. Thus a

single emotional trauma in the sexual conflicts of hysterics may produce a long-lasting symptom which by its fixation in the unconscious, recurs when activated by numerous future associations, internal and external. A similar mechanism occurs in the ego conflicts of the traumatic neurotics where the conflict centers about the body ego and not around the sexual objects of the individual. In addition to the symptoms due to the traumatic neurosis, the patient may have any other types of symptoms, an aggravation of preexisting neurotic symptoms, a return of old repressed symptoms. The hysterical individual will develop hysterical symptoms; the obsession type, phobias. The schizoid individual will withdraw further into his own world of unreality. The paranoid will project all his difficulties, become insistent in his demands, and even litigious, and be very resistant to treatment. These symptoms will be superimposed or co-associated with the symptoms of the traumatic neurosis. The symptoms that pertain to the traumatic neurosis remain fairly stable and are not easily displaced into other symptoms as occur in the psychoneuroses. This may be because in the psychoneuroses the conflicts are apt to center about objects, whereas in the traumatic neuroses, it only centers about the physical self.

The localization of pain to the area of trauma is not a symptom of the traumatic neurosis itself. It is more like the type of symptom seen in hypochondriases where the pain is in the nature of a hallucination and may seem very severe to the patient. It is due to the intense fixation of the patient on the site of the injury. The desire for the pain is projected onto a part of the body in a similar fashion to the projection of guilt, love or hate onto other persons in paranoia.

Symptomatology

ACCORDING to Kardiner, "The Traumatic Neuroses of War" (p. 86), there are certain features common to all traumatic neuroses:[1] (1) Fixation of the trauma. The patient's life seems to center around it. It results in altering the patient's concept of himself and the outer world. (2) A typical dream life characterized by aggressive-submissive dreams. Dreams of violence in which either the patient or someone else is being injured. (3) Contraction of the general level of functioning, intellectual, emotional and physical. (4) Irritability. (5) Proclivity to explosive, aggressive action. These symptoms refer to the contact of the patient with the outer world, his relationship to persons and objects. He becomes more sensitive to the dangers of the outside world and has an inhibition of his aggression, his activity, his work. This restriction is a defense of his personality to avoid the new threatening outside world.

Freud, in "Beyond the Pleasure Principle," explains the traumatic neuroses as a sudden flooding of the psychic apparatus with excessive stimuli for which it is unprepared. The task of the psychic apparatus is now to restore its old equilibrium, and it attempts to do so by setting up a countercharge to bind in small doses the excessive stimuli. In doing so, the rest of the psychic apparatus is robbed resulting in the inhibitions of the traumatic neurotic. It also results in the concentration on and fixation of the psyche on the trauma and in the ensuing anxiety.

The recurrent dreams of the traumatic neurotic, Freud explains as being due to the attempt of the psychic apparatus to master the original stimulus by repetition and in small doses. This explains the disappearance of the dream as the patient improves.

In the traumatic neurosis of civilian life, the secondary gain of compensation may be so important as to outweigh the primary traumatic neurosis. The trauma may be slight, the symptoms unimpressive, but the patient continues to have them, continues to be unable to work. As he improves, he usually prefers to postpone the fatal day when he must return to work. It seems strange to us, and the patient will often remark about it, that he continues to have his symptoms when his compensation award is only about one-half of his former income. Yet it seems that this so-called secondary gain is not only a monetary gain. We must remember other gains; the feeling of security, of being protected by the loving mother, of having no fears for the future as long as the compensation check continues to arrive, of getting revenge on the employer which may symbolize the overcoming of the hated father or father surrogate of the patient's childhood.

When we consider the secondary elaborations, we must consider not only the gains but the losses, the anxiety built up as a secondary elaboration, the guilt feeling about the neurosis and the compensation, the anxiety about the inability to work, to face the world, to be a man without being dependent.

Prognosis

A TRAUMATIC neurosis has a tendency to spontaneous recovery. The effects of the individual trauma wear away with time, abreaction and with the readjustment of the individual to his work and social environment. The tendency to fairly rapid spontaneous recovery is often interfered with by the secondary gain of the neurosis. In the traumatic neuroses of war there is an immediate secondary gain after the patient reaches the hospital. He discovers that it is one way of getting out of the war or reaching home, and he continues with his symptoms which now have a secondary purpose. In the traumatic neuroses of war the possibility of compensation seems to be a later development. But in the chronic case, this secondary gain of compensation in a war neurosis seems to maintain the symptoms in many cases with great perseverance and obstinacy. It appears today that the chief difference between the traumatic neuroses of war and the compensation neuroses of peace is that in the war neuroses the element of escape from danger and of return to home and family is of great additional importance. In the compensation neuroses of peace this secondary gain, the avoidance of danger, is not so important. The greater gain seems to be in the weekly compensation check which gives comfort to the ego which is striving to restrict activities in order to avoid the harmful environment induced by the primary neuroses.

Treatment

IN THE foregoing discussion it is obvious along what lines treatment must proceed. The patient should be treated before the secondary gain has a chance to develop; the earlier the treatment the better the prognosis. The natural tendency to recovery will then proceed unimpeded. In practically all traumatic neuroses there seems to be a maturation period between the time of the injury and the onset of the symptoms. This is especially marked when no real injury has been suffered by the body to confuse the symptoms due to the traumatic neurosis. It is of course understood that a traumatic neurosis develops irrespective of injury. If the patient can be reassured and given psychotherapy in this early stage, the prognosis is best. If we could avoid the secondary gain in some way, and allow the natural tendency to recovery

to proceed uncomplicated, the possibilities of rapid recovery are much increased. By early treatment the various attitudes of the ego toward the environment are not permitted to harden, and the undoing of the effects of the traumatic incidents is enhanced by resuming early contact with the world of reality. The ego meets the world again, finds it relatively harmless, and becomes accustomed again to the ordinary vicissitudes of life. There is a harm often done by physicians and others in the early stage of the traumatic neurosis, and that is the suggestion by the behavior or speech of the physician that there is some serious injury to the patient. This is especially harmful where the patient is of a hysterical or suggestible type. The seriousness of the organic trauma must be carefully considered of course, but the realization must be ever present that a careless word may fix the traumatic experience as a serious threat to the integrity of the body of the patient.

For psychotherapy the patient is better treated by a physician who does not represent the company. The physician to be helpful must represent to the patient the protective parent. He must help the patient to regain his confidence in the world and make him feel that the world is again a safe place and does not threaten him bodily. If the physician who is treating the patient is the same as the one who is responsible for stopping the payment of compensation, this type of relationship with the patient is well-nigh impossible. The patient is on his guard and conscious of the fact that something he may say might stop the compensation and throw the patient, who by this time considers himself helpless, into a heartless world where he will be left to starve or depend on the dole of public charity. The patient would rather continue his dependency on the compensation award than take the risk of trying to compete again in the outside world which appears unfriendly, and in which his competence to succeed appears weakened. It should be the part of the physician treating the compensation neurotic to make the patient stand on his own feet. The aim of therapy is to make the patient regain his confidence in a less hostile world than the world of the traumatic neurotic. It means making the patient see the reality situation and making him want to test his mettle as a man in the real world. The fear caused by the fixation of the traumatic incident in the mind of the patient must be pointed out to him, and the paralyzing effects of this fear must be realized. Putting the patient back to work as soon as possible has a great therapeutic value. In order to do that we must make the patient feel that returning to work does not threaten his compensation award or discontinue it altogether. Where the patient feels that he is not really capable of resuming his former duties, he must be reassured and provision made that, by returning to work, the patient gains and not loses financially. He must be rewarded for trying. He must be returned to work that he feels himself capable of doing, and his income from work must be made greater than his compensation award. He must be made to realize that a failure at work will mean nothing more than the return to full compensation as before. Such a method in the long run will save money for the insurance company. It implies cooperation between the insurance company and the employer because these patients may require special attention, supervision and work situations. At first there may be no financial gain for the insurance company, but in the long run, I feel that this aspect of treatment is well worth trying from an economic point of view. The work provided must also be stimulating and liked by the patient for it acts as a stepping-stone to reality. These aspects of treatment pertain to the traumatic neurosis itself. Where psychoneuroses, personality disorders, and others types of psychiatric disturbances are added to the picture of the traumatic neurosis or where the trauma merely precipitates a psychic disturbance which is not a traumatic neurosis, the treatment will have to be the ordinary methods of psychotherapy used for these disturbances. And last, but not least, organic and psychosomatic disturbances should be treated in the ordinary medical or surgical ways. The problem of compensation is a difficult one to handle. On the one hand, if the compensation continues recovery is retarded to the patient's disadvantage. On the other hand, since the neurosis must be attributed to the traumatic incident and presumably would not have occurred without it, it would be unfair not to give the patient the compensation to which he is entitled. The solution of some of these cases seems to lie in the direction of a lump sum as a settlement in those cases where there is obviously no organic damage of a disabling character and where the prognosis for recovery is good.

CASE 1. Traumatic neurosis without compensation features in a patient with a previous tendency to neurosis, persisting for years with varying intensity and aggravated by physical or work stress.

D. O. Male shipfitter, age 24, married, no children. Family history: Non-contributory.

At the age of 18, the patient suffered a very severe head injury when the car in which he was riding overturned. He developed anxiety more easily than the average before the accident, but has been much worse since. He was unconscious and delirious for about three or four days after the accident and then confused for about 10 days. X-ray of the skull was negative for fracture. He remembers having anxiety dreams in which he would fall towards the ground with a sense of great fear. He never reached the ground. These dreams disappeared after several months. He complains of intolerance to noise at times, and at other times, he finds hearing difficult in the right ear. He feels that excessive noise makes him weak and gives him a feeling of subjective giddiness. He also complains of restlessness, inability to concentrate, irritability, tremulousness, and ease of tire. At times he has shooting or aching pains which seem localized deep within his skull. He does not complain of any tenderness or soreness and has only occasional mild headaches. He is afraid of working with large or dangerous types of machinery or in any work environment where there is some physical threat. His symptoms have been definitely worse since beginning work in the shipyards approximately a year ago. There are no conflict factors in his home situation. Neurological examination is essentially negative except for functional tremors and excessive perspiration.

CASE 2. A traumatic neurosis in a weak, dependent, unstable male with rapid and complete recovery after settlement by a compensation award.

H. M. 38 year old married laborer, with one child. Family history: Non-contributory.

Past history shows that the patient has always been unstable, submissive, unable to keep a job for any length of time. He worked as a cab driver and for the WPA in periods of unemployment.

The patient states that he was injured in September, 1943, when a piece of steel struck the back of his head. He was confused, but not certain whether he became unconcsious. X-rays of the skull were negative. There was no retrograde amnesia. He complained of dull throbbing and occipital headaches in the general area of the trauma. He also complained of tremulousness, sweating, periods of diminution of consciousness with several episodes of syncope. These were accompanied by great anxiety and extreme weakness. There were no convulsive movements

or rigidity. One attack was seen by a physician who made a diagnosis of hysteria. After four months of treatment, mainly with prostigmine, the patient stated that there was no essential improvement in his condition and that he was unable to work. He felt confused, unable to concentrate or to remember, tired easily, and felt depressed. The depression he attributed to his being unemployed, his wife and child ill, his rent unpaid, his lack of funds, and his living in a noisy unsuitable apartment. He was not receiving compensation and felt very bitter about it.

However, in December he came into the clinic feeling very much improved and wishing to return to work. He stated that his rich uncle had come in from the East to see him and had promised to set him up in business provided the patient made a man of himself.

A week later he was very much worse again. He was to appear before the Industrial Accident Commission later in the week in regards to his claim. A settlement was made. The patient improved very rapidly and returned to work almost immediately but not in the shipyards.

He was last seen early in January, 1944, when he was free of complaints, working, and felt he needed no further treatment.

CASE 3. A traumatic neurosis in an unstable, paranoid woman with psychogenic asthma of many years' duration.

M. W. 43 year old, married female, shipfitter with four children, all living and well. Family history: Non-contributory.

The patient has been quite unstable and nervous for many years and has had psychogenic asthma since childhood. Has been told by physicians that what she needs is a new set of nerves. She has had three laparotomies; once for appendicitis, once for a gall-bladder operation and once for a tubal pregnancy in 1931 following which she developed thrombophlebitis in the right lower extremity.

She states that early in February, 1944, she fell about two and a half feet between two beams and struck the anterior abdomen in the general area of the left, lower quadrant. She was very upset emotionally by this fall. She reacts with anxiety to any trauma, physical or psychological. She has been that way as far back as she can remember. This anxiety is usually accompanied by asthma. After the above accident the patient felt no pain but described a feeling of numbness, weakness, and nervousness. She rested for a half an hour then walked to the first aid station. When she began to walk she noticed some slight aching in the left lower quadrant. This aching became worse until she found herself unable to walk. Asthma developed when she began to walk to the first aid station and has been fairly constant since. The aching in the left side developed into a pain which was sharp and stabbing, radiating from the back to the front and down the left side. A similar pain in the right lower quadrant and thigh in 1931 was felt when she developed thrombophlebitis following a laparotomy for a tubal pregnancy.

She continued to work until the middle of February, 1944, when her asthma pain and nervousness increased to the point where she could no longer continue. At no time had she, or anyone else, noted a bruise on the anterior abdominal wall. She felt that her injury must be deep-seated. Neurological was negative except for functional tremors, increased perspiration, decreased skin sensitivity, and a quadrangular area of hyperesthesia in the left lower quadrant. The abdomen was soft, no masses were felt, but the patient complained of severe pain on deep palpation in the left lower quadrant. She also stated that a pervious examination had made her pain much worse.

The patient is emotionally unstable, somewhat paranoid, and hysterical. She demands compensation for what she considers a serious injury to her "insides." Her pain is the type of hallucinatory pain which occurs in the traumatic neurosis.

CASE 4. Withdrawal symptoms in an apparently previously healthy individual.

R. T. A 30 year old, married, childless carpenter. Previous and family history—essentially negative.

The patient states that on February 17, 1944, while plugging a fixture into an electric socket, he received an electric shock. This shock left him very tremulous and nervous, but he continued to work until February 26, 1944. He was unable to sleep the night of the accident because of nervousness and anxiety dreams. He dreamed that he was being "shocked" again. The evening of the "shock" the patient's wife stated that he seemed to be inattentive to her, and that she would have to call him several times before he answered. He seemed to be gazing off into space and had a vacant expression on his face. He was indifferent to everything. These symptoms became more severe until February 27, 1944, when the patient seemed to become quite deaf. When questioned regarding his thoughts, he stated he was thinking of nothing in particular and was happy as long as his family was taken care of. He had not a worry on his mind.

In the morning his hearing is quite good but becomes increasingly bad as the day wears on. His hearing is also worse when he becomes more nervous. His brother states that he was a normal, happy individual before this injury; cheerful, friendly and outgoing.

He was first examined on March 3, 1944, at which time his neurological examination was negative except for a facial tic, functional tremors, increased perspiration, decreased skin sensitivity. Deep reflexes were hyperactive but equal. Hearing was reduced in both ears. Air conduction was better than bone conduction. There was no localization with the Weber test. Explanation and reassurance were given to both the patient and his relatives.

He was again examined on March 10, 1944, at which time his hearing had returned to normal, and he was very much more alert. His facial tic had become worse, and his tremulousness and nervousness had increased. This is to be expected. As the withdrawal symptoms are lost, the anxiety becomes more evident as the world has to be faced again. This patient will probably be able to return to work very soon, and prognosis for recovery is excellent.

CASE 5. A traumatic neurosis with cerebral concussion where no compensation was involved.

N. W. 55 year old, white male electrician with two children. Family and past history: Essentially negative.

On December 24, 1943, the patient fell down a flight of eighteen steps and was hospitalized for about two weeks. X-ray of the skull was negative. A lumbar puncture shortly after the injury revealed a spinal fluid grossly tinged with blood. Neurological examination revealed no localizing signs. The patient was comatose for about two days after the accident and stuperous for several weeks thereafter.

On January 15, 1944, he came to the clinic and complained of some difficulty in thinking and hearing. However, he felt well enough to return to work. He said that his symptoms were not important. He had always been a conscientious provider for his family without previous history of illness. He complained of some deafness and attributed his difficulty in understanding his wife to that. He was irritable and had some giddiness with sudden postural changes of the head. He also complained of tremulousness, ease of tire, weakness, and increased sensitivity to noise. He had occasional dull frontal headaches. For a few weeks after the accident he had anxiety dreams, generally of the type where he was being threatened with serious injury.

He was last seen on February 28, 1944, when he stated that he felt well and wished to return to work. He said that he still had occasional frontal headaches and was somewhat irritable, tremulous, and tired easily. However, he was very much improved and it was felt that he could resume work in another week or two.

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Practical Application of an Industrial Dental Program

K. W. MISHER, D.D.S.,
International Harvester Company, Chicago

YEARS ago one of our instructors said to us that the most important factor in the success or failure of a man in dental practice is the personal equation. The maxim is as true in an industrial practice as it is in a private practice. However, in an industrial practice we have all of the elements of private practice plus innumerable other problems for which a solution should be immediately available. To cope with the situation the dentist in charge must have a plan. This plan should fit all of the complexities of the organization for whom he works. It should consider the needs and desires of management and labor equally, and also the interests of organized medicine and dentistry to an important, if somewhat lesser degree.

Generally speaking, management is interested in industrial dentistry primarily because of what it will do for the good of the company and its business. In conducting his practice, the dentist must have records to prove that he is saving the company money, rather than costing it money. What dental services save any company money? Let's consider them under separate headings.

1. *Emergency Relief of Pain for Employees.*

This service in the long run probably saves the least money for the company, but the saving is most easily demonstrable. The employee should leave his department with a form on which is printed the time of leaving; on this same slip the dentist or his assistant stamps the time of arrival and departure from the dental office. The slip is finally marked with the time he arrives back at his department. If these slips are collected periodically, the time spent visiting the plant dental office can very easily be checked and an average figured. This average time subtracted from the time the employee would take going to his private dentist would represent the saving in "man hours" to the company. Of course any intelligent department head who had ever had an ache or pain of his own (and which one hasn't) would know the adverse effect of pain on safe and efficient work, and realize the necessity for its elimination.

2. *Elimination of Foci of Infection in the Mouth.*

The dentist in this case, starting with the supervisory employees of the company, makes a complete clinical and radiographical survey. He systematically examines a prescribed number each day. His record chart should include a section in which the company physician can note the physical condition of the patient, noting particularly any ailment which might have any relation to diseased teeth. At the end of six months or a year after the removal of all mouth infection, depending on how much time he has available, the dentist should examine the mouth, checking again with the physician as to the patient's present physical condition. A check of absentee and efficiency records on a representative number of these patients would prove the value of this part of the dental program to the company. Of course, there will be many cases where the company physician will refer individual cases to the dentist for immediate attention because of physical ailments he believes may be caused by infected teeth. The records of all these cases will so soon build an overwhelming case proving the necessity for healthy mouths, that formal records will *seem* superfluous.

3. *Recognition of Mouth Conditions Which Point to Industrial Disease.*

Certain dyes and paints, chemicals and lead, cause general physical conditions which show mouth symptoms in their early stages. Periodical examinations by the dentist will discover these conditions, and their prompt referral to the company physician can often save the company heavy penalties.

4. *Creation of Good Will.*

The successful operation of a dental department in an industrial concern is a definite factor for good will. The company benefits from this, and will recognize the benefits after a very short while. The dentist, to create this feeling of good will to him and to the concern which employs him, must treat each individual patient as though that patient were important to him and to the company. Any hurried or disinterested treatment will create ill will rather than good will.

5. *Dental Health Education.*

In the long run, educating the patient to keep a clean and healthy mouth benefits the company for which he works more than any of the other factors. With a staff of people whose mouths and teeth are healthy, we are likely to have a healthy and contented personnel who are efficient and lose little time from work. Dental health education can be carried out in several manners: first, individual instruction to the patient at the chair; second, lectures at company groups and company schools; third, pamphlets on the important phases of mouth care and disease. Of all these, the most important is instruction at the chair. These personalized talks stick with the patient better and make him feel they are for him individually.

Labor, as is management, is interested in industrial dentistry from a selfish standpoint. The people who represent labor want industrial dentistry for what it will do for them. They benefit from emergency treatment because it saves them time, and from the health they get from the elimination of foci of infection. The same holds true of recognition of mouth conditions and dental health education. The things they will remember are the concrete things the dentist does for them. They remember gratefully the toothache which was relieved, the neuritis which left because of the removal of dental foci, the denture sore spot he relieved, and the advice he gave at the chair which benefited. They won't remember with favor the examination that seemed to have the company interest rather than theirs at heart.

To create good will for an industrial dental department, the personnel of the department must have the good will and interest of the employees at heart, both individually and collectively. They must attend all company parties, bowl in their bowling leagues, golf in their golf tournaments and generally fraternize with them in a dignified, yet genuinely friendly manner. It will not be long before the dentist and his department under such conditions are considered an integral and necessary part of the organization.

Many other details enter into the application of a successful dental industrial program. These details vary with the type and size of the program involved. There is no individual ideal plan which can be used without variation.

THE DENTAL OFFICE: The office should be centrally located, if in a large plant, and at any rate it should be in conjunction with the medical department. If possible, the dentist should not work alone. A capable dental assistant will keep those accurate records that are such an essential part of an industrial practice. She can also do the radiography work and, in states where they are licensed, she could be a dental hy-

gienist. Two chairs are almost necessary because of the speed which is such an essential part of dentistry in industry. For example in a plant of 5000 employees with a fairly complete service, yearly examinations alone will mean more than 5000 appointments, depending on labor turnover. Add to this another 3000 emergency treatments, 10,000 service appointments and perhaps another thousand miscellaneous visits, and we have a total of 19,000 visits to the dental office. If each dentist handles 25 patients in a day, three dentists would be required working eight-hour days to complete such a program. Any dentist planning to work in industry should sit down with a pencil and paper and figure the number of employees, their needs, and the number of appointments it will take to do what he plans before he finds he has planned more than he can accomplish. He should start with a modest program and build it up as facilities and help justify. If he cannot cover the whole field, he should find what part is most important in his particular establishment. If it's an insurance concern, they are interested in statistics. He should see that they get them by keeping full and accurate records of frequent examinations. Also, if emergency treatments are first, they should be given first consideration. However, it is never necessary to forget any of the other parts of the dental program. If he cannot handle all parts of the program himself, he can get them done with the help of the dentists in private practice. If he handles his industrial practice in an ethical fashion he can get the help of the dentists in the community. If he works with them, they will work with him. In some cases he will have to refer the radiography, in others surgery, and in others industrial accidents to the dentist of the patient's choice.

All of the work he accomplishes will have to be in addition to a good job of getting along with people. Naturally he will strive to please the patients, but there are others to be considered. The plant manager, superintendent, owner, or whatever the title of the head man is, will have to be considered. He will be interested in whether the dental department uses the clerical staff or telephone too much, do they conserve lights, do they follow and observe any and all of the hundred and one rules that are a part of any organization, and the plant dentist can't afford to get professional and figure that he is above ordinary rules.

The industrial dentist will have to work closely with the industrial relations man of the concern. In industry, difficulties you may have with a patient are not, as in private practice, strictly between you and the patient. They are a matter for consideration of all and, as such, the industrial relations department frequently must be called into consultation.

The unions and their officials also will have something to say about the industrial dental practice. However, if the plan is worked wisely, their main concern will be to amplify it.

The last, but probably the most important, individual having contact with the dental department is the company physician. He may be the immediate superior to the dentist or the departments may be separate, but regardless, the utmost cooperation and good will must exist between the physician and the dentist. They can be of the greatest help to each other. I do not believe that in any case the dentist should subordinate his knowledge or judgment on strictly dental matters to the physician even though he may be working for the physician. The physician however, has charge of the dispensary, its rules, and the patient's health. No industrial dentist who wants his department to succeed will challenge the rights of the physician in those fields.

Small Plants Health Service Successful

DEMONSTRATION of an integrated service to small plants in the Astoria area, Long Island City, New York, has been found successful and recommended as a model for other industrial areas, following an evaluation conducted recently by members of the Industrial Hygiene Division, U. S. Public Health Service.

The program is being carried on by the Office of Industrial Health of the New York City Department of Health and the Division of Industrial Hygiene of the New York State Department of Labor. Begun in January, 1945, it covers seven plants, with a total working force of 2,151, approximately half of them women. The plant products are processed foods, paint, photo machines, carbon brushes, porcelain products, cleansing chemicals, and printing.

The project contributes to each plant the services of a registered public health nurse on an hourly basis, without cost to the plant. Management is given assistance in interpreting the health provisions of the New York State labor laws and industrial codes which apply to each plant. Another service supplied by the Office of Industrial Health is technical assistance given by the unit's engineer and chemist in the detection, control, and prevention of occupational health and accident hazards. The unit's industrial physician offers consultation service to the plant physicians in diagnosis of occupational diseases and in connection with medical problems arising in the plants. Consultative nursing service is available. Chest x-ray and sero-diagnosis are provided employees. Forms for recording and reporting procedures are furnished.

Management contributed facilities and equipment for medical and first-aid offices in each plant, and carries the cost of service by a physician, recruited by the Queens County Medical Society. The physicians spend varying amounts of time in the plants, according to arrangement.

Among services provided the employees of these plants are complete preplacement examinations, periodic subsequent examinations, follow-up of any defects found, frequent examination of workers exposed to known toxic substances, first-aid services in injury or illness, post-absence examination, and health counseling. Persons needing further attention are referred to family physicians for treatment, and recognized specialists or clinics are recommended upon request of the worker.

While emergency injury and illness treatment is given in all the plants concerned, occupational diseases are treated by the plant physician in three of the establishments, and two others treat all such cases except dermatoses, which are referred to specialists. All the plant medical departments have made arrangement for hospital care and ambulance service with a nearby hospital, and all have referral arrangements with specialists and specialty clinics for special medical care. The program in every plant includes chest x-ray, venereal disease testing, and dental examination. Welfare services and nutrition counseling are given by the plant nurses.

Average per capita cost of each plant medical department has been $12.98, to the time of evaluation, comparing favorably with a cost of $17.47 per capita for plants with 500 or fewer employees found in a study made by the National Industrial Conference Board.

The attitude of management toward the health program was found to be uniformly favorable. Their responses laid stress upon over-all economies resulting, and upon improvement of labor-management relationships.

Dispensary visits reflect the confidence of employees in the plant medical departments, averaging 2½ visits per employee in one recent month.

The Health Committee of the Queensboro Chamber of Commerce has expressed great interest in the project, and is working to extend it to many more plants of the area. The medical, nursing, and dental societies have approved its organization and practices.

From *Industrial Hygiene News Letter*, January 1946.

Dinner Group in honor of
DR. DONALD HUNTER and DR. RICHARD SCHILLING,
Bohemian Club, San Francisco, December 8, 1945

Back Row (Left to Right): Karl M. Bowman, M.D.; Rodney R. Beard, M.D.; Jean S. Felton, M.D.; Edwin E. Ghiselli, Ph.D.; Frank J. Clayton; Harold T. Castberg, M.D.

Center Row (Left to Right): J. M. McCullough, M.D.; Thomas Addis, M.D.; R. O. Schofield, M.D.; Henry H. Kessler, M.D.; Charles K. Field; L. R. Chandler, M.D.; Cecil C. Cutting, M.D.; W.P. Shepard, M.D.

Front Row (Left to Right): Donald Hunter, M.D.; Robert T. Legge, M.D.; Richard Schilling, M.D.; Bert Hanman

DR. PILGRIM

AGAIN to Wisconsin, and again this time for a case of tuberculosis in an industrial employee, wherein the commission requested a hearing because the claim had previously been dismissed by agreement—it appearing that the commission of Wisconsin does not dismiss any case "for cause," even when requested by both parties—the hearing thus becoming a matter of form, it being interesting to note that the commission desires the facts for record, whereof the result was a decision that the tuberculosis had no relationship to the employment. . . . BROWSING in "A Blind Hog's Acorns," a most interesting "attenuated autobiography," as characterized by its author, DR. CAREY P. MCCORD, and finding indeed an appealing series of experiences in the early development of industrial hygiene in this country—this book, it seeming to Pilgrim, a distinct public relations contribution to the field of industrial hygiene, and so written that non-professional persons can gain a considerable perspective regarding the practice of this special line of work. . . . AND concerned with reading manuscripts and editing some galleys for a publication, new to the field, and with the preparation of an editorial for one of the digests. . . . AND with Madam Pilgrim to see "Incendiary Blonde," a story of Texas Guinan, well done by Betty Hutton, reminding Pilgrim of former vaudeville days. . . . AND to New York City for the 275th meeting of the National Industrial Conference Board at the Waldorf Astoria, there speaking at a round-table conference on "Company Health Services," on the subject "Objectives and Scope of An Industrial Health Program," with DR. LOYAL A. SHOUDY speaking on "Medical Personnel in Industry," and DR. WILLIAM A. SAWYER on "The Organization of a Medical Department"—DR. MCIVER WOODY, of Standard Oil of New Jersey, presiding with his usual aplomb, conducting a long questions-and-answers period following the presentations, in which there were most interesting subjects discussed; and attending the general dinner session in the evening—which was yclept "What Causes Strikes?"—at which DR. VIRGIL JORDAN, President of the Conference Board, provided a brilliant preliminary dissertation to the main speakers, DR. LEO WOLMAN on "Conflicting Wage Theories;" MR. CHARLES M. WHITE, President of Republic Steel Corporation, on "Government Intervention;" and MR. THOMAS I. PARKINSON, President of Equitable Life Assurance Society of the United States, on "Monetary Manipulations". . . . THEN next day to New Jersey to visit an old college friend of 37 years' acquaintance, COL. ALBERT W. GREENWELL, who is now the Medical Director of a textiles manufacturing company, going over with him the administrative procedures for the medical department in that industry; and

—Continued on page 118.

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1946 Conference on Industrial Health

THE five professional organizations which are actively engaged in industrial health activities will hold their ANNUAL CONFERENCE ON INDUSTRIAL HEALTH at Chicago, April 8-13, 1946. These associations are (1) AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS (Thirty-first Annual Meeting); (2) AMERICAN ASSOCIATION OF INDUSTRIAL NURSES (Fourth Annual Meeting; (3) AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (Seventh Annual Meeting); (4) NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (Eighth Annual Meeting); (5) AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS (Third Annual Meeting). Headquarters at Hotel Sherman.

"Shall Be Permitted" as Free Choice

THE "Washington Letter," in *J.A.M.A.*, February 2, 1946, notes that a Democratic Representative in Congress charges the American Medical Association with "misleading the public," in that it has "misrepresented the Wagner-Murray-Dingell bill." This accusation from a member of the Democratic party comes to attention on the same day we learn "that Mr. Roosevelt at the Yalta conference agreed Russia should hold full sovereignty over the Kurile Islands," whereas we were assured "shortly after Yalta that there were no secret agreements whatever of a political nature." "Last June, after the death of Roosevelt, Churchill told the house of commons that no secret agreements had been reached at Yalta except a pledge to give Russia three votes in the UNO assembly. The state department, after consultation with Roosevelt, had made a similar solemn assertion in a formal statement a week before Roosevelt died." Reserving for a moment any comment on the alleged "misleading" by the A.M.A., it may be remarked that deliberate misleading of the public seems invested with an aura of great virtue when it is done by prominent Democrats, becoming a horrible crime only when someone not amenable to all administration proposals can be accused of doing it. This while there still echoes in our ears the 1940 pre-election misrepresentation of the "again, and again, and again" promise to the mothers of America that their sons would not be sent to fight on foreign soil! Now, as to the A.M.A. That organization has not misrepresented the W-M-D bill; misrepresentation is no part of its purposes or practices. But even if some one were desirous of misrepresenting, why go to any pains in this instance when the bill itself is its own misrepresentation—with what it lacks in that respect being lavishly (and expensively to the taxpayer) furnished by its proponents. For example, the title and preamble are belied by the substance. And again, it is affirmed and reaffirmed in press propaganda, speeches and radio exhortations—even in "fireside chats"—that the bill provides for "free choice of physician." On "free choice" see paragraph 2 of section 905 of the bill itself: "Every individual entitled to receive services from a physician shall be permitted to select, from among those designated in paragraph 1, those from whom he shall receive such services, except specialist services . . . and to change such selection in accordance with such rules and regulations as may be prescribed." To anyone appreciative of what freedom means in a free country where every citizen is a sovereign citizen, the phrase *"shall be permitted to select"* is the shibboleth of the yoke of slavery. The citizen is "permitted" to select *now*, without any government benevolence; it is a part of his inherent rights as a citizen to make his own selection. This pernicious, alien, collectivist and bureaucratic bill ("two bureaucrats to every physician") proposes that he give up his present freedom and receive in return a qualified permission. If that is "free choice" then the Bill of Rights itself becomes a Bill of Permissions, and the concentration camp for "free" American citizens who don't like it is just over the horizon.

Railroad Surgeon Pioneers

REGARDING "the nativity of industrial medicine in America—there is more than a shadow of truth in the unkind observation that some devotees in this field mark its birthday to coincide with the date of their own entry therein. Even in the years of this writing, many 'Johnny Come Latelys,' climbing onto the outstretched palm of the Titan, promptly begin to shout about 'pioneering.'"* An interesting bit of history in connection with the antiquity of the phase of industrial medicine represented by the organized medical services of the railroads is revealed in the following: In 1871, shortly after the Chicago & North Western completed its line to Omaha, Nebraska, DR. A. L. WRIGHT, of Carroll, Iowa, was appointed C. & N. W. District Surgeon at that point. He held this position until he died in 1913, at which time the present incumbent, DR. O. C. MORRISON, who had been DR. WRIGHT'S assistant for several years, succeeded him as District Surgeon at Carroll. Thus this appointment has been held by two men, one after the other, for 75 years. This situation is probably unique in the fact that only two incumbencies cover such a long period. It is certainly notable, in that 75 years, in the history of organized medical services, is, indeed, a long time.

*CAREY P. MCCORD, M.D., in "A Blind Hog's Acorns—Vignettes of the Maladies of Workers."

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MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

Dr. Page Succeeds Dr. Denno

DR. ROBERT C. PAGE, a medical officer in the Army Air Forces during World War II and assistant medical director of Standard Oil Company (New Jersey), has been appointed general medical director of the company, succeeding DR. WILLARD J. DENNO, its chief medical officer since 1918.

DR. DENNO, who developed the company's medical department from an office with one part-time physician to a world-wide organization having 11 hospitals and more than 150 physicians and 1,500 nurses and attendants, helped Jersey Standard to become one of the most advanced companies in the field of industrial medicine. He will continue with the company as medical consultant. DR. ALFRED GAGE, an assistant medical director, will be in charge of medical service and advice for affiliated companies in Latin America.

DR. PAGE, who was born in Devonshire, England, January 9, 1908, came to the company in 1939 from the staff of the Northwestern University Medical School, where he was a Fellow in Medicine. He is also a Fellow of the American College of Physicians and a Diplomate of the American Board of Internal Medicine. A graduate of the University of Detroit in 1929 and the Northwestern Medical School in 1934, he received post-graduate training at the University of Leeds in England. He was resident physician and surgeon at the Presbyterian Hospital, Philadelphia, from 1934 until 1936. During the next two years he practiced internal medicine in Oak Park and Chicago, Illinois, and at the same time was in charge of occupational diseases for the Hartford Accident and Indemnity Company. Entering military service as a captain in 1942, he was discharged three years later as a lieutenant colonel. He was command surgeon of the First Air Commando Force under Colonel Philip Cochran and served in the China-Burma-India theater where his force took part in the first air invasion of Burma and received the Presidential Citation. His experiences in this invasion are very interestingly described in his recent book, "Air Commando Doc" (review later). From June, 1944, until his discharge, he was chief of Professional Services, Personnel Distribution Command, Atlantic City, New Jersey. During his earlier company service, he wrote numerous articles relative to preventive medicine and inspected medical progress in affiliates of Standard Oil (New Jersey) in Canada, South and Central America, Europe and Africa as well as the United States. He believes that preventive medicine in the postwar period must assure employees of a more healthful working environment and present a more constructive health program for employees. "Progressive management is doing much in stabilizing incomes and preparing the employee for retirement following a period of satisfactory service. It behooves the medical profession to assist these annuitants in preparing themselves for the comfort, peace and financial security they have earned."

DR. ROBERT C. PAGE

DR. DENNO, who came to the company after 12 years of private practice and public health work, was born in Castleton, Vermont, in 1876. In 1918, relatively few physicians were employed by industry to examine and treat accident cases, and DR. DENNO and the staff he assembled faced many new and difficult situations. During his term as general medical director, DR. DENNO directed the building of employee hospitals and houses and the construction of water and sanitary systems and hastened development of mosquito control in tropical countries.

DR. PILGRIM

—*Continued from page 115.*

to COL. GREENWELL'S home at Montclair for luncheon, meeting again, after many years his consort, also a former classmate, and enjoying with them old-fashioneds which it was discovered later were made of all the ingredients except the whiskey, a commentary on the palate efficiency of both the COLONEL and PILGRIM! . . .THEN enroute to New Orleans on the Panama Limited, driving later in the day of arrival 45 miles south into the Delta region, to study the industrial medical and hospital services of the most prominent industry in that region, and meeting with the company officials and the board of directors of the medical aid association for the discussion of the most interesting problems of providing a medical service both for employees and their dependents, as well as community residents; and later in the week on the way back, through New Orleans, lunching with other company officials at the famous Antoine's, where were food and drink of the best. . . . AND back in time to participate in the second concert of the season of the Chicago Business Men's Symphony Orchestra, playing Cesar Franck's D Minor Symphony, and Joseph Schuster, soloist, beautifully playing Schumann's Concerto for cello, Opus 129; and where of great interest was the announcement of the Thousand Dollar prize to be given by Henry C. Lytton & Sons for the best symphonic selection based upon the theme "State Street," this competition open to musicians and composers in the Chicago area, to be played at a later concert. . . . AND planning trips and engagements to St. Louis, Milwaukee, and Purdue University, being a combination of compensation hearings, university lecture, and a presentation to an industrial nursing group. . . . AND receiving the January issue, Vol. 1, No. 1, of the new magazine *Occupational Medicine*, published by AMA, this excellent journal, in its bright cover announcing to INDUSTRIAL MEDICINE "Here I am—Move over!"—nevertheless finding our editorial self sincerely glad to say "Welcome!" and to extend congratulations and best wishes to all concerned, and particularly to the Editorial board whereof DR. WILLIAM A. SAWYER is Chief Editor, and DRS. A. J. LANZA, ARTHUR L. WATKINS, W. F. MACHLE, WINFRED OVERHOLSER, C. D. SELBY and REXFORD L. DIVELEY are Associate Editors—there being none for whom it is more a pleasure to make room than themselves in so much as they bring to industrial medicine the aggregate of the best of all the medical specialties which touch upon each other with finest professional expression in the great common denominator of the care of the health of the employed population. Wherefore we bespeak for *Occupational Medicine* the full measure of the success which, under the auspices of its launching, it deserves. . . . AND being moved to add expression of the thought—from whence derives the classical quotation above "Current Articles of Quality"—that excerpts from texts, by way of quotations, bring the reader and the author face to face, whereas abstracts and synopses are generally the author's thoughts in some other writer's words, thereby often losing the savor of the style in order to miss no part of the substance. Whereof it being our conviction that the direct quotation preserves the one without forfeiting the other—the "beautiful figures and patterns" are indicated where they are not spread out and extended—concerning which it has been pleasing to have been much complimented, particularly by various of the authors quoted!

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The Present Work of the Industrial Health Research Board of Great Britain

RICHARD SCHILLING, M.D.,
Secretary, Industrial Health Research Board of the Medical Research Council, The Industrial Health Research Board

THE Industrial Health Research Board is a standing committee of the Medical Research Council, and it advises and assists this body in promoting investigations into health problems among workers. Financed by a direct grant to the Medical Research Council from public funds, it was first formed in 1918 as the Industrial Fatigue Research Board and its title was changed to the present one in 1929. The Board includes among its members an employer, the secretary of the Social Insurance Department of the Trades Union Congress, professors of social medicine, industrial medicine, and public health, a physiologist and a psychologist, a physician, a statistician, and the Senior Medical Inspector of Factories.

In the summer of 1940 when the British army had lost most of its equipment on the beaches of Dunkirk, this country was forced to make full use of all its available manpower to equip its armies. Everything possible had to be done to reduce inefficiency and ill health among its industrial population. Government departments and industries began to think very seriously about the health of industrial workers and to realize that much could be done to improve health and efficiency at work by applying what was already known of the general principles of industrial hygiene. As a first step industrial, medical, nursing and personnel services were greatly expanded. But it soon became evident that knowledge of many of the industrial health problems was scanty or was based on peacetime experiences and in many instances made out of date by the new conditions of wartime manufacture such as the blackout, long hours of work, and by the employment of women in vast numbers on new jobs. So there was a need for more research which in 1942 led to the reconstitution of the Industrial Health Research Board whose terms of reference were widened to include problems of industrial disease. More important than a mere refinement in terms of reference was a widespread appreciation that it was necessary to intensify industrial health research in the fields of physiology, psychology, and toxicology. The previous work of the Board has been described elsewhere (Schilling, 1944). The following is a brief account of its present activities.

Department for Research and Industrial Medicine

THE work of this Department at the London Hospital has already been described by its Director, DR. DONALD HUNTER, in the Cutter lecture delivered at the Harvard School of Public Health (1945). Its formation in 1943 followed the widening of the Board's term of reference to include industrial disease. There are obvious advantages in having such a department in a large teaching hospital. Undergraduates can be readily taught the clinical aspects of industrial medicine and industrial toxicology by the research staff who will gain handsomely from their close contant with clinical medicine and the discipline of teaching others.

Occupational Psychology

IN 1944 the Medical Research Council established a Unit of Applied Psychology in the University of Cambridge. Its staff have dealth principally with *ad hoc* problems, arising from the war and undertaken in response to requests from Service Departments. They have been concerned with the task of suiting the job to the man, of suiting the man to the job, and of improving man's performance at his work. On the industrial side, DR. ALICE HEIM and her associates have devised a battery of tests which have been standardized on a large number of entrants to factories and Government Training Centres. This battery contains a paper test with verbal, arithmetical and visual sections based on relations of identity and opposition, analogy completing scores, and on following instructions; a mechanical ability test, and on inspection test. Research is being carried out on consistency and validity of test results and of assessments by foremen and others. The same team are now devising tests for assessing qualities of foremanship.

Farmer, (1926, 1929, 1933) who in association with others did much useful work on accident proneness, is studying the capacities of blinded officers and others with special abilities, with a view to helping them obtain suitable employment.

A new type of recording system has been developed by members of the same unit and applied to a group of coal mines to trace causes of accidents, sickness and absenteeism. It is hoped that the results will indicate fields for research into improved equipment, and for reallocation or retraining of accident-prone workers. Most of the research on suiting the job to the man, such as the design of instruments, machinery and lay-out, has been carried out for Service departments who have referred to this Unit display and control problems such as design and illumination of instrument panels in night fighters, the optimum position, gear-ratio of handles and levers on guns. This work has an obvious application to industry in the design of hand operated machinery. All the above investigations fall within the ambit of the Unit whose researches have been described in more detail by Craik (1945). There is another team of industrial psychologists interpreting the significance of absence rates in a number of factories who have kept records since the war. DR. WYATT, who directs this work, has just completed a preliminary study in a number of engineering factories of night work and shift changes and its effects on output, absence rates, and incidence of minor accidents. He has also questioned a random sample of workers on the subjective impressions of night work. This report will shortly be published but it can be said that Wyatt concludes that the fortnightly change over from day to night seemed to be the best compromise between the physiological and social requirements of those workers studied.

Neurosis in Industry

YET another team directed by DR. RUSSELL FRASER has just completed but not yet published the results of a comprehensive investigation into the incidence of neurosis among industrial workers. A random sample of 3,000 workers representing a total of 30,000 engaged in 13 light and medium engineering factories was examined. It has been shown that neurotic illness is responsible for a substantial proportion of total lost time, more in fact than is demonstrated by using the less accurate criterion of insurance doctors' certificates.

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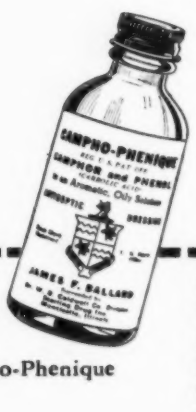

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RUSSELL FRASER and his colleagues took one and a half hours to test and examine each worker. His recommendations based on the correlation of incidence and environmental factors repeat what industrial medical officers and others have been demanding for many years—good human relationships between management and workers, that every worker should have a job appropriate to his abilities, that work which involves long periods of concentration without scope for initiative and responsibility should be avoided; that more attention should be paid to industrial lighting and to the planning of work programmes to introduce variety and interest.

Lighting

RUSSELL FRASER and his colleagues have illustrated a significant relationship between the incidence of neurosis and lighting efficiency at work. In many industries in Great Britain lighting is of a low standard, and as a result it can give rise to inefficiency, injury and ill health (Weston, 1944). Yet it can be easily improved and no doubt it would be if industrialists were more fully aware of its importance. A report, describing the scientific basis of modern lighting practice as recommended by experts, is being prepared by MR. WESTON and it is hoped that it will act as an up to date reference book for industry and its lighting engineers.

A systematic study of the nature of visual tasks in industry has been started, and it may well lead to the development of a scientific method of assessing the standards of vision and lighting required for operations which are essentially visually controlled. The possibility of analyzing any task and measuring its "critical" features—such as visual size and contrast—is being explored, so that, from known relations between these variables and illumination for a satisfactory standard of performance, the desirable illumination for any given task may be computed.

In the course of this work, opportunity is being taken to make observations of current lighting practice, and to test the validity of a simple method for gauging the adequacy of illumination. This method is based upon the hypothesis—for which there is some experimental support—that the adequate working illumination is approximately a constant multiple of the minimum illumination in which the work can be accomplished.

Other work on lighting includes investigation into the effect of movement on the illumination required for visual tasks presenting detail of different size and contrast, and the influence of age on the illumination-visual efficiency relation.

The Building Industry

IN THE second World War Great Britain suffered widespread destruction of dwelling houses and other buildings. Until recently it has not been possible to spare the labour for repairs or for any substantial amount of rebuilding. So this island country is now faced with a serious shortage of houses, and everything possible must be done to speed up the building of new houses and at the same time to build better homes from the point of view of health and comfort. The Medical Research Council and the Ministry of Works have collaborated to provide a team of psychologists to study problems connected with the selection of apprentices and trainees, and methods of training operatives. Thus it may be possible to reduce wastage in training, and the time necessary to train an efficient operative.

Heating and Ventilation

KEEN interest is also shown by the Ministries of Health and Works in domestic heating and ventilation. In spite of the volume of work which has been done by the Industrial Health Research Board on heating and ventilation ever since its inception, not to mention the investigations carried out in the U.S.A. and elsewhere, there remain wide gaps in our knowledge. It is particularly desirable that answers to some questions should be obtained as early as possible, so that this information may be applied in the design and equipment of buildings during the recontruction period.

More needs to be known of the subjective effects of radiation from incandescent sources such as open fires, and the relation between intensity and distribution of radiation on the one hand, and air temperature on the other. Radiations of long wave-length are absorbed almost completely at the skin surface, while those of shorter wave-lengths (i.e., from hotter sources) are to some extent reflected from the skin surface, but the relationship between the amount and type of radiation and comfort is not known.

Although earlier studies have been made on the factors which give rise to impressions of freshness or of stuffiness, further work is required particularly with regard to the minimum amount of fresh air which is desirable under various conditions of occupation.

Factory work will not be overlooked, and it is hoped to make field studies of the environmental conditions achieved by the use of certain modern systems of warming and cooling buildings.

Naval Ventilation

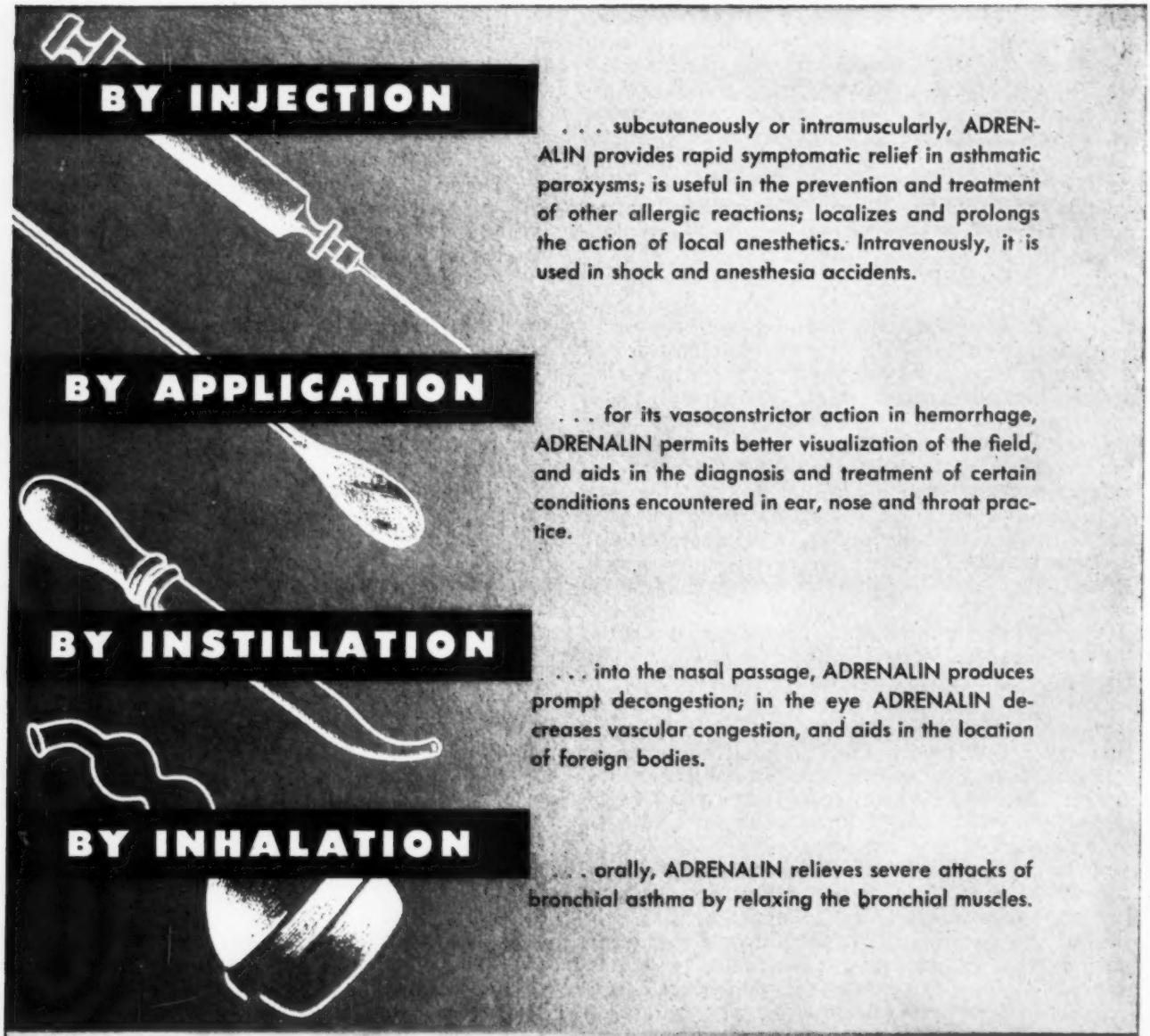
ON BEHALF of the Royal Naval Personnel Research Committee various studies have been made of the ventilation and thermal insulation of H.M. ships. For the measurement of environmental warmth in ships, some development of various instruments has been necessary.

This has been done and a brief manual on the subject is being published as one of the Medical Research Council's War Memoranda entitled "Environmental Warmth and Its Measurement" (1945).

Measurement of Warmth and Effects

THE work done by Bedford (1936) on a scale of equivalent warmth enabled the four variables which make up the thermal environment to be expressed in a single figure. This scale was only substantiated over the range of warmth which is more or less comfortable for sedentary persons, and it was realized that further work was desirable so that the scale could be extended to cover cold and hot environments. War experience has shown that this work is urgently necessary, not only for industry, but also for the Services, and for those who live in the tropics.

The effective temperature scale, devised by Professor Yaglou and his associates, has been of incalculable value in heating and ventilating engineering. It appears, however, that with respect to hot environments such as those near the limit of human tolerance the effective temperature scale needs revision. A further point—important in some industries and in some naval situations—is that the scale makes no allowance for radiant heat. There is in existence no tested scale which, for hot environments, takes into account all the thermal factors. Scientific curiosity and practical needs both demand that further investigations should be made.



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Transmission of Air-borne Infection

OTHER workers on the Council's staff have been studying bacterial contamination of the air of buildings, and have investigated methods of air sterilization. In the near future this work will be more closely coordinated with Dr. Bedford's investigations.

Industrial Dusts

MANY instruments are available for the sampling of air-borne dusts, and various techniques are used in the evaluation of samples. The instruments vary greatly in their sampling efficiency, and the efficiency of a particular instrument may vary according to the size of the particles of which the dust cloud is composed.

There is need for more knowledge of the degree of accuracy that can be achieved with these different instruments, and for a critical study of methods of evaluation. A comprehensive investigation on these lines is being carried out. To begin with studies are being made in the laboratory, where precise measurements can be made. Later, comparisons will be made in industry, and especially in coal mines.

Pneumokoniosis among Coal Miners

IN AN effort to prevent pneumokoniosis among coal miners, much attention is being given to the suppression of dust in mines. It is hoped that, during the field tests on sampling instruments, there will be an opportunity of studying the efficacy of some of these dust-suppression methods.

Research in South Wales coal mines by Hart and Aslett (1943) showed the occurrence among coal miners of a lung condition due to dust which did not fall within the definition of silicosis as used for compensation purposes in Great Britain. In has been called pneumokoniosis of coal miners. In its early stages it shows on the radiograph as reticulation. This research led to important changes in the Workmen's Compensation Act, which now provides for the payment of compensation to all workmen in the coal mining industry who contract pneumokoniosis as a result of their employment in and about mines. The changes in this Act have markedly increased the incidence of compensatable pneumokoniosis as shown in Table I, and as a result pneumokoniosis in the South Wales coalfields has become without doubt the most urgent problem in industrial medicine which Great Britain has to face.

TABLE I.
CERTIFICATES OF DEATH AND DISABLEMENT GRANTED BY THE SILICOSIS MEDICAL BOARD

	SOUTH WALES		REST OF THE COUNTRY	
Date	Deaths	All Disablements	Deaths	All Disablements
1931 (1st June-	..	....	12)	(49
1932 31st Dec.)	..	....	39)	(122
1933	28	181	3	18
1934	33	192	2	19
1935	46	192	5	36
1936	69	296	8	23
1937	59	244	13	42
1938	51	391	8	44
1939	66	400	11	45
1940	78	434	15	35
1941	63	483	13	41
1942	77	749	16	51
1943	85	1,154	15	124
1944	111	1,603	44	445

If the number of men deemed unfit to work in coal mines continues at the same rate or increases, these coalfields will be faced with a very serious man power problem. Added to this there is reluctance among miners to continue their employment in mines or to allow their sons to work in mines. So with the cooperation and encouragement of the Ministry of Fuel and Power, the Medical Research Council have recently established a Pneumokoniosis Research Unit in South Wales. Its Director, DR. CHARLES FLETCHER, has already made plans to investigate six main aspects of the problem.

The first is an immediate one, namely to determine those non-mining industries in which pneumokoniotics can be usefully and suitably employed.

The second is to find more accurate information about the prognosis in early forms of the disease. Already it is known that men with x-ray reticulation and even those with nodulation may continue to work underground for long periods without any change in radiological appearance. And it is also known that a miner with x-ray reticulation may leave the industry and his condition progress to show major consolidation. Obviously more accurate knowledge about prognosis in the early stages of the disease can help to alleviate the manpower problem.

The third aspect is the problem of diagnosis of the degree of disablement. Again, if an objective method of assessing disability can be found, it may prevent many men leaving the mines unnecessarily and remove others who if they remained in the mines would become totally disabled.

Fourthly, to get more detailed knowledge about the aetiology of the disease, it is proposed to select a group of men about to start work at the coalface and to carry out a continued survey of their environmental conditions at work. They will also be studied at regular intervals clinically, radiologically and physiologically. This may help to make a more accurate determination of the significance of dust concentration and particle size, other environmental conditions and physical characteristics in the causation of the disease.

Fifthly and sixthly, work on the pathology and the treatment of pneumokoniosis will be continued.

Artificial Sunlight Treatment

IN MINES, artificial sunlight treatment has become popular and for some years past in Great Britain there has been an increasing demand for the establishment of solaria in industry. The popular belief is that regular small exposures to ultra-violet light will replace natural sunlight and increase resistance to infection and improve general health.

An investigation has just been completed by DR. DORA COLEBROOK in three communities, a government office, a factory and a mine. The general scheme was to keep under observation in each of the three communities not less than 1,000 volunteers, and to divide them by random selection into three main groups of approximately equal size:

Group 1 to receive full range of ultra-violet rays from quartz mercury arc lamps.

Group 2 to receive irradiation from identical lamps but these lamps to be fitted with glass screens impermeable to the shorter ultra-violet rays.

Group 3 to receive no treatment.

The records of the sickness experience of the three groups were collected during and for a period after irradiation had ceased and the figures submitted to statistical analysis. Subjective impressions were also recorded.

In the report which will shortly be published, the author has attempted to supply all the data from which a scientist can assess the significance of the results and at the same time to explain to intelligent managements and workers the methods used in, and the need for, scientifically controlled investigations.

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Other planned and uncompleted researches of the Industrial Health Research Board include inquiries into the aetiology and epidemiology of peptic ulcer among various occupational groups, a study of psychological problems in the resettlement of veterans who are not disabled, and the preparation of a report on medical and health records in industry other than sickness absence records which have been dealth with in a previous publication (I.H.R.B. Report No. 85, 1944 (a)).

Conclusion—Role of the Universities

THE Industrial Health Research Board is not the only organization undertaking industrial health research in Great Britain, and it would be quite wrong if it were for monopolies in research are just as dangerous as monopolies elsewhere.

With the asisstance of the Nuffield Foundation and quite independently of the Medical Research Council, three British Universities, Manchester, Durham and Glasgow have established Departments of Industrial Health. They will help to meet the growing need for the education of industrial medical officers, nurses and undergraduates, but they must also do research, for education cannot flourish without this stimulus, particularly in a branch of medicine in which so many fields still remain uncharted. There are also many opportunities for the industrial medical officer to investigation the health hazards in his own factory. He is on the spot and should therefore understand better than anyone else the hazards of his particular industry. As far as possible he should have sufficient assistance not to be overburdened with routine work and he should be able to get help and advice from University professors and others. Thus there is ample opportunity for research to be developed; centrally by the Medical Research Council in conjunction with the Factory Inspectorate of the Ministry of Labour, the Mines Medical Service, and other government departments responsible for the health and welfare of industrial workers; and regionally and locally by University departments and industrial medical officers themselves. But if the results of research are to be put to their fullest use there must be changes in the organization of existing medical services.

Expansion of Industrial Medical Services

IT MUST be remembered that in Great Britain a major proportion of workers is employed in small industrial concerns. Table II (Garrett 1943) shows that in 1936, 52.7% of those employed in factories worked in establishments with less than 250 operatives, and since then the distribution of personnel according to size of factory has not changed very much. There are approximately 950 industrial medical officers in Great Britain (Assoc. Industr. Med. Officers, 1945) of whom some 250 are whole-time. Only a very small proportion of these are attached to the small plants where working conditions are usually below the standards found in the larger ones. Thus industrial medical services should be made as comprehensive as possible, if conditions of work are to be improved for the greatest number of workers, by the widespread application of the principles of industrial medicine and hygiene, kept up to date by constant research.

TABLE II.
FACTORIES UNDER INSPECTION IN 1936

Size Group	Factories		Numbers Employed	
	Number	Percentage of Total	Number	Percentage of Total
1— 25	108,765	76.9	709,943	12.8
26— 50	12,636	8.9	447,824	8.1
51— 100	8,738	6.2	622,118	11.3
101— 250	7,155	5.1	1,134,048	20.5
251— 500	2,565	1.8	885,856	16.0
501—1,000	1,016	.7	691,204	12.5
1,001 upwards	519	.4	1,039,196	18.8
Total.....	141,394		5,530,189	

Education Through Popular Pamphlets

IN THE PAST, the reports of the Industrial Health Research Board have been published only as scientific records of the results of research. There will always be a need for these but there is also a need for publications written in non-technical language which can be readily understood by directors, works managers, workers representatives, and the workers themselves. A wider knowledge of industrial hygiene by all concerned can lead to a better understanding of what is needed to improve working conditions. With this in mind the Board started a new series of pamphlets. Three reports entitled "Heating and Ventilation: Lighting and Seeing," Absence from Work: Prevention of Fatigue," and "Why is She Away" (I H.R.B. 1943, 1944 (b), 1945) have already been published. Their popularity both at home and abroad has proved how much they were needed. With other methods of education and of stimulating interest, much more can be done to get the man and woman at the work bench, in the mine, and on the railroad, and those who pay them to realize what can be done to make life healthier and more useful both at work and at home.

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UNIVERSITY of Pittsburgh, School of Engineering, Department of Industrial Engineering, announces a new evening course in Industrial Hygiene Engineering offered in cooperation with the Department of Industrial Hygiene, School of Medicine (Ind. Engr. E 151 AR Industrial Hygiene Engineering—2 credits): A course in the engineering aspects of industrial hygiene and a detailed study of ventilation engineering relating to the control of industrial health hazards designed for engineers and other qualified students. Introductory lectures on human physiology as related to industrial exposures and the nature and appraisal of the commonest industrial health hazards will be given. The remainder of the course will emphasize the engineering and practical design of types of ventilation to correct unhealthful or undesirable working conditions; the control of excessive exposures to toxic industrial materials; and the control of exposures to solvent vapors, toxic metal fumes and dusts, toxic gases, mists, and excessive heat. Practical problems will be assigned for the lectures. *Prerequisites:* Bachelor of Science degree, or equivalent industrial experience, with a background in college mathematics and chemistry. *Time:* Monday 7:50 to 9:35 p.m., beginning February 11. *Instructor:* MR. W. C. L. HEMEON, B.S., M.S., Senior Fellow, Mellon Institute; Ventilation Engineer, Industrial Hygiene Foundation; and Instructor, Department of Industrial Hygiene, School of Medicine.

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Industrial Medicine in the Philippine Islands

LIEUTENANT COLONEL JEAN S. FELTON,
Medical Corps, Army of the United States

ONCE the germ of industrial medicine is planted in the psyche of the physician who is interested in bettering working conditions in industry, it is eradicated only with the greatest of difficulty. The particular lust for additional information and experiences in this very fertile medical specialty leads one to the making of inquiries, regardless of time or place. Having been assigned to an Army unit in the Philippine Islands because of previous duty as an industrial medical officer, the writer was keenly interested in learning of the practice of industrial hygiene and medicine in this recently liberated Commonwealth. Through fortuitous circumstances, the particular camp area allocated to this Army installation was a large sugar mill "somewhere" in Luzon, the largest of the islands. One of the several buildings of this mill area was a small hospital operated previously by the mill, although currently being used by a numbered station hospital of the Army. Questioning revealed that this hospital rendered medical care to employees of the mill, so reasoning dictated that a medical care plan of one sort or other must have existed, and investigations were made into this particular phase of one of Luzon's leading industries.

Philippine Industrial Medical Legislation

THE care of one's employees in the Philippines is mandatory for all owners or operators of commercial, industrial, and agricultural establishments, and, because of these existing governmental orders, medical attention is given all the workers in such organizations. Thus, irrespective of whether the owner or operator is a private individual or corporation, or the Insular, provincial, or municipal government, he is obligated "to furnish free emergency medical attendance to his employees and laborers."[1] This portion of the law is of interest in that strict provisions are made not only for private industry, but also all political or government operated industrial establishments. American statutes not only do not provide for such medical services in industry, but at no time would group executive orders aimed at both federal and civilian enterprises in a single directive.

All employers having workers who have served continuously for at least six months, or whose services are necessary for six months' time, are considered as permanently employing these laborers or other workers. Furthermore, the owner must certify to the Director of Health, each "semester" of the year, the numbers of workers engaged by him in any locality. Specific instructions are laid down as to the types of medical facilities to be established in industry, their scope being determined by the number of employees. If there are thirty workers employed, the owner must maintain a stock of emergency medicines, under the charge of a nurse or "other intelligent person." In purchasing such supplies for industrial use, the employer procures his medications from the Bureau of Supply, through the Director of Health, "at the same prices that the government would have to pay for the same"—another manifestation of the desires of the Commonwealth to bring medical care to its workers.

When the plant or industrial population exceeds 400 persons, the owner must employ the services of a physician, and provide a dispensary or emergency hospital of sufficient size or capacity to provide ample medical attention to the employees. This is not necessary if such a facility exists within a convenient distance, (recently interpreted as three kilometers or less, or 1.86 miles) in the form of a hospital with free beds for poor patients. As the mills are frequently established in the center of large plantations such a hospital is located, usually, at too great a distance. This allowed distance, interestingly noted, is the distance from the *residence* of the employees or laborers, and not from the work area where they might be engaged at the moment.

The Bureau of Health prescribes the types and quantities of medications to be stocked in these infirmaries or hospitals, and sends inspectors into the field to ascertain if the commercial, industrial, or agricultural establishments comply with all the requirements of the law. These inspectors are permitted to come into the industry at any time or hour of the day, and they may demand assistance of the management in the conduct of these investigations. In the consideration of medical supply, all such establishments are classified in the following categories: (A) 30-100 employees; (B) 101-200 employees; (C) 201-400 employees; (D) Over 400 employees.

These various medical facilities then stock a minimum accepted supply for their particular size classification. As might be expected, the larger installations must have not only increased quantities of drugs mandatory for the A and B groups, but also additional medications not granted the smaller facilities. A perusal of the supply lists reveals one Philippine name differing from the Pharmacopoeia as we know it, "Fluid extract tikitiki," which is a product widely advertised throughout Luzon, usually in the form of signs over drug stores or on the sides of buildings, reading "Take Tiki Tiki for Beri Beri."

In those industries where over 400 employees are on duty, additional in-patient care is required, and a hospital must be provided in the ratio of one bed for every 50 workers permanently employed. The working areas prescribed for such a hospital include "one operating and dressing room, one drug room or pharmacy, one doctor and nurses' office, minimum equipment and supplies as per . . . . list, and an adequate system of waste disposal." If the employees are of both sexes, several wards shall be maintained. The staff comprising this type of hospital includes in addition to the physician, one graduate nurse, one ward attendant, and one helper for every 10 beds or less. Minimum lists of equipment, surgical instruments, and linen for the eight bed hospital (400 employees) are given. The lists resemble very closely any standard American civilian hospital supply lists, with the single differing item of linen being "Mosquito nets. . . .16." A certain choice is granted the physician, however, in that substitutions are allowed upon request to suit his particular preferences.

The law delineates further that, in computing one's employees, the total shall include only laborers or employees whose monthly wage is not in excess of 75 pesos (37½ American dollars) and tenants on share, financially dependent for their work and subsistence upon the owner. Three tenants of this latter group are counted as one laborer. Those owners or operators who fail to provide the stock of medicines required, or do not maintain a hospital with the services of a physician for the 400-worker group, are subject to a fine of one to 25, and 10 to 200 pesos, respectively. In governmental installations no specific sliding scale of fines is outlined, but the defaulting officer in charge of the establishment is held liable. Additional provisions state that in the event of epidemic, catastrophe, fire, or disaster resulting in extraordinary numbers of ill or injured workes, the owner shall not be required to provide medical care under such circumstances. Of exteme interest is the statement that in no case shall the owner be held civilly or criminally liable for any consequence of the emergency industrial medical care rendered, as its acceptance is entirely optional with the worker or with his family, or individual authorized to speak for him. This is a far cry from the thinking of the malpractice-conscious patients of the United States.

Certain functions are allocated to the district health officers and presidents of sanitary divisions, in that they are empowered, as authorized representatives of the Director of Health, to conduct the inspections mentioned above, and must do so at least once every six months, or at any time when it is considered necessary. They also are to pass on the qualifications of "the intelligent person" assigned to the safe keeping and administration of the emergency medications. This person, incidentally, is not to render any surgical treatment of any kind.

The administrative order providing for this in-plant

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**Ant, M., N. Y. State Jour. Med., Sept. 1, 1945.*

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medical care program went into effect on April 1, 1933, and from such observations as one can make, it was complied with fully before the war or the period of occupation. It must be stressed that study of pre-war records is practically impossible for almost all of the governmental buildings were destroyed during the liberation of Manila, and all documents were lost through fire. At the present time of writing, the Federal bureaus are scattered throughout the city, occupying such space as is available. Former schools, colleges, office buildings, and even private homes are being used until the time of rebuilding of the capital. War has played havoc with the government buildings, for they were used as enemy strongholds, for all were reinforced concrete structures, subjected to withering direct fire. Burned and twisted filing cabinets and desks among the ruins testify to the loss of valuable documents. Relevant material that is available rests in a few privately-preserved copies of statutes, or in the excellent memories of the Filipinos surviving the occupation. Of all the Federal buildings destroyed, the one outstanding structure that survived was the Malacañan Palace, the Presidential Offices used as the seat of the Occupation Government.

The Sugar Industry

THERE are many industrial activities present in the Philippine Islands, the products of which have brought world-wide recognition. These included mining, lumber, sugar, rice, hemp, tobacco, textiles, rattan, leather, and the arts. Of these, the sugar industry was selected for observation because of the immediate proximity of one of the largest mills to the encampment area of the writer. As former mill employees were working for the Army, and later were beginning to filter back to the mill, numerous discussions existed relative to the re-opening of the mill, the pre-war picture, and future possibilities of the industry, and their connection with independence. Any approach to the scene was characterized by lively conversations and whole-hearted attempts to help. At every step, the appreciation and friendship of the Filipinos for the Americans were manifest, and aided immeasurably in a clearer understanding of the industrial medical service, as it was carried out by the owners.

In the province where the sugar mill under study is located, the production of sugar cane is accomplished through an intricate system of land ownership, tenancy, and share-cropping. All arable land devoted to the growing of cane, is the property of the owners or planters, (apart from certain experimental lands of the mill), whose large tracts averaging one hundred hectares (one hectare equals 2.7 acres) are known as *haciendas*, or plantations. The land is actually worked by many tenant laborers, or *aparceros*, who independently are responsible for the preparation of the soil, planting of the seed, and harvesting of the crop of the parcel of land assigned to them. These laborers utilize the draft animals of the owner, perhaps two to four carabao or bullocks, and likewise are responsible for their care and maintenance. In certain districts, itinerant groups of workers may be hired to work the entire holdings, but this *Administration* system has not proved popular with either the owner or the worker, for the interest of the latter individual in his job is not present. Raising the crop of sugar cane is a seasonal procedure, and the months of harvest and milling are roughly from November to March. The harvested crop is taken to the mill, or Sugar Central, where the cane is crushed and the juice is processed into sugar. The returns on the cane are divided between the planters and the Centrals, and the former, in turn, divide this income among themselves and their *aparceros*. Recently the percentage returns have been increased in favor of the planters over the Centrals.

The Central under discussion has as part of its mill holdings a *barrio*, or village, nearby wherein live the permanent employees of the mill. Before the war there were approximately 265 family heads, or wage earners, and assuming an average family to have five members, the population was about 1,325 people. The husbands or fathers only were employed, for the minors attended school, and only a very few women were hired. The houses, not huts, in which these people lived all belong to the mill, and they were inspected frequently by a sanitary inspector, for infractions of sanitary regulations laid down by the mill. In this little community electricity, water supply, and waste disposal systems were provided, utilities not present in the average *barrio*. Certain stores were made available to these workers, and food could be purchased through the mill. Two community camps are situated side by side, one for the American staff members, and the other for the Filipinos. The recreation facilities in these shaded camp areas included swimming tanks, tennis courts, bowling alleys, a baseball ground, and a golf course, and the employees were seemingly a happy group.

During the milling season, about 800 additional family heads were employed from surrounding *barrios*, with a potential family population of approximately 4,000 individuals. The significance of this additional group will be shown later. In this season, which represents the greatest employment period of the year, the following classifications of occupations are noted: (1) bag fabricators; (2) boiling housemen; (3) distillerymen; (4) fermentation tenders; (5) firemen; (6) gardeners; (7) guards; (8) laboratory chemists; (9) laboratory technicians; (10) laborers; (11) locomotive engineers; (12) mechanical plant engineers; (13) mill tenders; (14) mixers; (15) office workers; (16) sanitary inspectors; (17) stablemen; (18) still operators; (19) storage tenders; (20) sugar cane loaders; (21) sugar cane unloaders; (22) yeast propagators. The only women workers included in this list were those employed for the making of sugar bags or sacks from large bolts of jute burlap.

The activities comprising the industrial operation involve the harvesting of the cane crop, transporting it to the mill, preparing the cane for juice extraction, boiling, filtering, evaporating, crystallizing, centrifugating, and bagging of the sugar. By-products that result, such as molasses and alcohol, and their uses, will be described. In the processing of the cane, the long heavy stalks are unloaded from the cane cars, which have picked up their loads in the fields, over portable track. This tangled mass of cane, as it is thrown on the carrier or conveyor, assumes a height of about six to eight feet. The cane then passes under revolving cane knives, which reduce the mass of cane to a blanket of about two feet in thickness. These knives prepare the cane for better crushing, and thus increase the capacity of the mill. The cut stalk segments then pass through a series of rollers, which are large heavy grooved steel drums, which squeeze out the juice. The juice flows down the roller grooves into juice pits (troughs) into juice tanks, from which it is pumped to juice scale tanks, where the amount of juice extracted is determined volumetrically. The fiber residue or *bagasse* resulting from the milling process is scraped off the rollers, and collected by the boilers. The next step carries the juice to heaters where the temperature is raised to just below boiling, and sufficient heat is produced to agitate the liquid. In liming tanks, slacked lime is added which tempers the juice, and the latter is then pumped through long rows of filter presses, where dirt, mud, and other extraneous particles are removed. The settling tanks are the next process point, where the lime is allowed to settle out, and the juice goes on to evaporators for the removal of a high percentage of the water. (The purity of the cane is measured by the water content, the lower the percentage of water, the purer the cane. Frequently, if heavy rains ensue before milling, the process is deferred, as the sugar yield is lowered through a high absorption of water by the cane.) From the evaporators the juice is collected in vacuum pans, and then is heated to above boiling point for four hours. Of the fluid resulting, crystallization of the sugar is accomplished in special containers or crystallizers, so that there now is a mixture of sugar crystals, molasses, and water. The mass of liquid goes to the reservoirs of centrifugation where all materials but the sugar are thrown off. This cleaning process produces the final raw sugar which is bagged and ready for export. It might be mentioned that there are three types of sugar produced or maintained: (a) raw sugar for export only, which is in need of refining in the United States; (b) refined sugar for domestic use only; and (c) reserve sugar

ON QUICK ENERGY

From Candies

MEN engaged in strenuous labor instinctively turn to quick-energy foods during rest periods to replenish waning glycogen stores. The popularity of candy during these "breaks" is well established by common observation. For candy not only has a universal taste appeal but—more important from a nutritional standpoint—it supplies quickly-digested, energy-producing nutrients to appease the appetite and satisfy the metabolic needs of the moment. Office workers, school children, housewives, and others engaged in semi-sedentary occupations can quickly benefit from this contribution of candy. Whatever the work that may be performed, candy through its nutritional contribution can lessen fatigue and increase muscular stamina.

THE NUTRITIONAL PLATFORM OF CANDY

1. Candies in general supply high caloric value in small bulk.
2. Sugar supplied by candy requires little digestive effort to yield available energy.
3. Those candies, in the manufacture of which milk, butter, eggs, fruits, nuts, or peanuts are used, *to this extent* also—
   (a) provide biologically adequate proteins and fats rich in the unsaturated fatty acids;
   (b) present appreciable amounts of the important minerals calcium, phosphorus, and iron;
   (c) contribute the niacin, and the small amounts of thiamine and riboflavin, contained in these ingredients.
4. Candies are of high satiety value; eaten after meals, they contribute to the sense of satisfaction and well-being a meal should bring; eaten in moderation between meals, they stave off hunger.
5. Candy is more than a mere source of nutriment—it is a morale builder, a contribution to the joy of living.
6. Candy is unique among all foods in that it shows relatively less tendency to undergo spoilage, chemical or bacterial.

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which may be exported, or refined for domestic consumption as the demands may indicate. (Refining is accomplished locally by re-centrifugation.)

The mill at peak load runs three shifts, for a 'round-the-clock production. Off season, there is but one shift, and this is used primarily for repair and maintenance of machinery. The yield of sugar averages about 10 to 12% of the weight of the cane, and the final molasses is 25 to 30% of the weight of the raw sugar processed, or about four to five gallons per ton of cane. The daily production of molasses in a Sugar Central is about 4000 to 5000 gallons per thousand tons of cane milled. Alcohol is a standard by-product of all sugar mills, and results from dilution with water and fermentation of the molasses. After the molasses is pumped from the mill proper to the distillery, it is diluted with water down to a 20% solution. To this is added a pure culture of yeast, to form a mash, which with the addition of sulfuric acid to prevent the growth of undesirable yeasts, is then allowed to ferment in large vats. Ammonium sulfate is added to the fermenting mash to hasten the process, and the procedure is complete in about 48 to 60 hours. The alcohol content of the fermented mash is about 6 to 7% by volume, and is now ready for distillation. Following the actual production of alcohol through distillation and condensation, denaturation is accomplished by the addition of such materials as benzene, ether, pyridine oil, or petroleum naphtha.

This alcohol is used both as industrial alcohol, and as an alcohol motor fuel. This particular feature of the mill lead to its seizure and operation by the Japanese during the occupation, and with imported and Filipino labor, additional distilling equipment was built, in an effort to produce high octane aviation fuel. The liberation of the islands precluded the completion of the enemy's plans.

The fibrous material resulting from the crushing of the cane, or *bagasse*, is used in the mill as fuel for the boilers. The burning of this material results in a very fine ash, which escapes throuh tall smokestacks. If these stacks are not hooded properly at the top, a soot settles over the surrounding buildings and ground. That *bagasse* which is not used, is sold for locomotive fuel, for weed-killers, or for use in laborers' stoves. It has been made into artificial wood, celotex, and also when mixed with molasses, has been briqueted for use as fuel. These processes in the main, represent the mill activities, although to the military, who have been seeing the new sights of the Philippines, one of the most interesting local features is the preparation of the soil (plowing, harrowing, and cultivating), and the hauling of the cane by the driven native carabao or bullocks (castrated cattle). The sight of the massive carabao pulling the home fabricated plow, or the bamboo harrow, or pulling the loaded carts, is probably the one memory that every American soldier will carry home of his stay in the Philippines.

Certain occupational health hazards must exist in this industry, but the workers claim little knowledge of such illness. There has been no morbidity resulting from exposure to the *bagasse*, and the solutions of the juice in any stage of the process do not contact the worker to allow either inhalation of the vapor, or skin contamination. For a while a phenolic spray was used in cleaning the mill, and several cases of dermatitis resulted, but, with substitution of steam as a cleaner, no further trouble was had.

The conveyors, of course, present physical hazards, and when one views the revolving knives, one can visualize the potential dangers, but industrial accidents have been few and minor. A worker can fall into the huge 30,000 liter fermentation vats, but to date that has not occurred. Sufficient railings protect the worker on staircases and high balconies. There is a constant threat of heat exhaustion among the boiler personnel, and a few cases are hospitalized each season. The Filipinos are accustomed to heat, and very frequently the heat inside equals that outside.

They consume considerable quantities of salt with all their meals, and do not use tablets as do newcomers strange to the tropics.

The Medical Plan

THE Sugar Central complies with all the requirements of the executive orders relative to the provision of ample medical care. The mill in question, however, has carried the medical program farther, and provides care to the worker's entire family. This is effectuated through a return to the mill of 1% of each worker's salary, so that for the cost of perhaps one cent a day, medical attention is available to all families, each averaging five members. Whereas the normal group to be cared for numbers 1,325, the milling season brings in many additional families, all of whom, through this pre-payment plan, become eligible for care. This group can number 4,000 so that facilities must be able to process any increased case load. Care for industrial accidents and occupational illnesses (specifically allowed by the Workmen's Compensation Act) is taken for granted. In addition, complete care was given the worker and his family for any condition that might arise. Obstetrical care, usually rendered in other *barrios* by midwives who are trained, is offered here in the mill hospital where a complete maternity service and the usual 10 to 11 day post-partum hospitalization were available. At one time an outbreak of typhoid fever caused an overloading of the hospital, but all patients were cared for.

Most of the cases are seen at the Dispensary, located in the heart of the mill area, and for these, out-patient care will suffice. The usual number of contusions, lacerations, burns, diarrheas, simple fractures, colds, and the like comprise the daily roster. Those conditions requiring additional attention are hospitalized at the mill hospital which is located on the edge of the American camp area, about one kilometer from the mill proper. Here, in a 35-bed institution, complete medical and surgical care was rendered by a full-time physician, three female nurses, one male nurse, four male orderlies, and three female attendants. Interestingly, there is a small patio inside the quadrangularly shaped building, and at one side is a life sized statue of Hygeia. The use of statuary is widespread in the islands and figures of Dr. Rizal, the national hero, are seen in all schoolyards.

Pre-placement physical examinations are mandatory—not a matter of choice of the mill owner, but are directed by Commonwealth law. Ordinarily a copy of the report is maintained by the physician, one is forwarded to the plant personnel section, and one other is sent on to the Bureau of Health (National). What use was made of the last copy could not be determined. It can be referred to, however, in the event of compensation claims. The physical examination report form, used universally in all industries may be seen in Fig. 1. It was difficult to ascertain the exact standards used in conducting these examinations for they have gone the way of most records. The general feeling is that the main contra-indications to employment were hypertension and tuberculosis. The latter disease is extant in the islands, and the population at large fear its spread. The government has done much to provide sanitaria for these patients, but there is an insufficient number of hospital belds to care for all tuberculous patients. Memories of the fulminating course of this disease seen in Filipinos emigrating to the United States, allow one to understand the national feeling toward the disease. As one drives along the island roads and there is much dust thrown up by the vehicles, the Filipino passers-by will always hold a handkerchief to their nose and mouth to preclude inhalation of the irritant. All examinations whether conducted in industry or school, or elsewhere, include fluoroscopic or roentgenographic studies of the chest. It is understood that before the war strides were being made in photofluorography in various hospitals in Manila. There is no varying set of standards for jobs of different physical demands, and all workers, irrespective of occupation, must meet the same physical qualifications.

Periodic examinations are done in industry, on either a monthly or annual basis, but as many workers in this area go from job to job, and the industries themselves spring up and die down, the long-time employee is a rare being. The men who have been in a single institution in the United States for 20, 30, or 40 years are unknown to commerce in the Philippines. Hence, the need for periodic

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examinations is lessened, and the pre-placement physical examination assumes greater importance.

Health education has been tried both by the Commonwealth Government and the industrial medical services. The opinion is that although the media used are good, they fail to serve their purpose. The workers read them when they are distributed, but, on acquiring a medical condition demanding care, they do not correlate the precepts

Administrative Order No. 13-C
Form No. 2

HEALTH EXAMINATION RECORD

Name of establishment..... *Location*.....
Name..... *Wage or salary*..... *Department*.....
Date of birth..... *Sex*..... *Civil status*.....

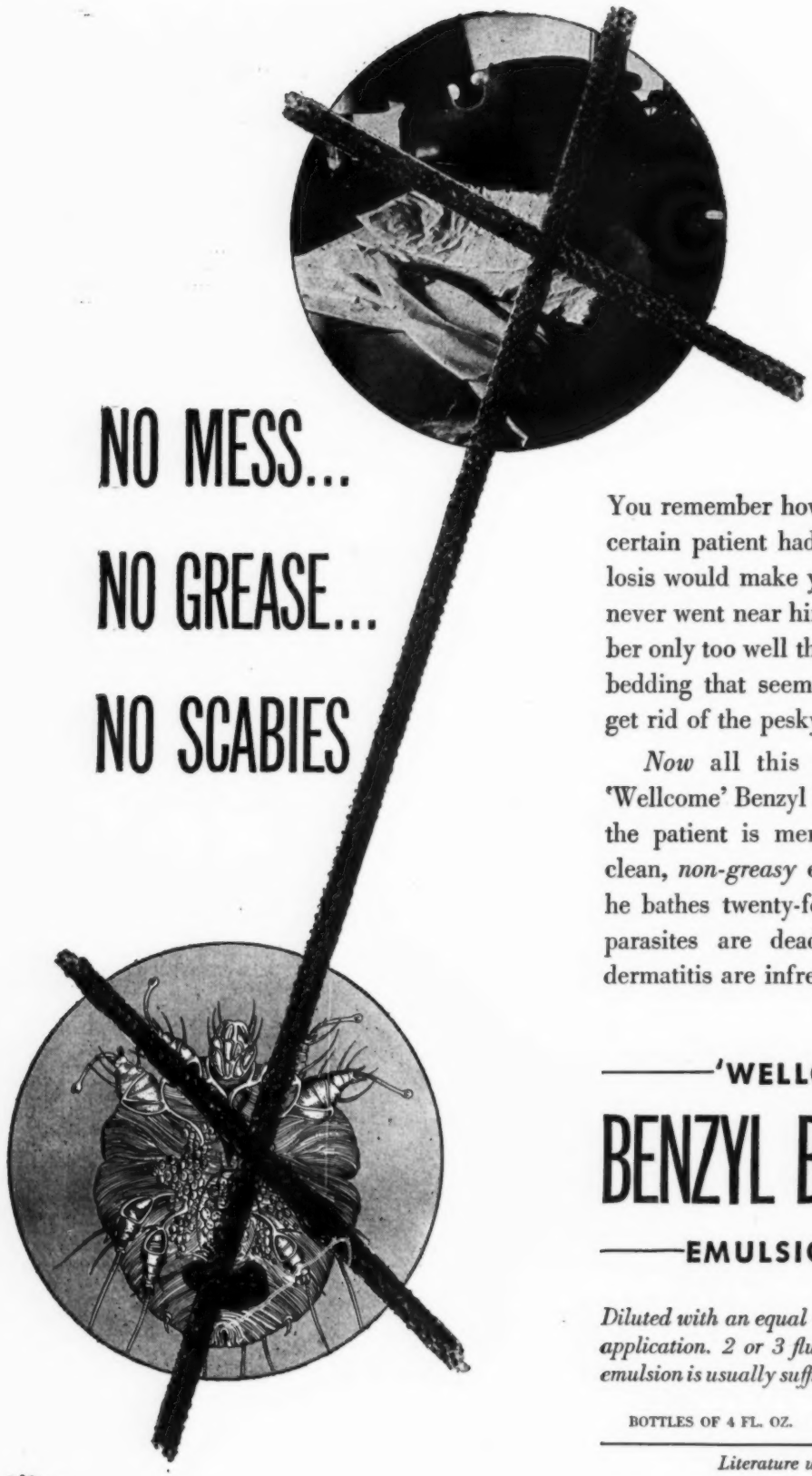
1. Date	Date Height cm.	Date Height cm.	Date Height cm.	Date Height cm.	Date Height cm.
2. Type of work	Weight kg.	Weight kg.	Weight kg.	Weight kg.	Weight kg.
3. Respiratory system					
4. Circulatory system					
Blood pressure	Systolic Diastolic	Systolic Diastolic	Systolic Diastolic	Systolic Diastolic	Systolic Diastolic
Pulse	sitting ; agility test	sitting ; agility test	sitting ; agility test	sitting ; agility test	sitting ; agility test
	after 3 min.	after 3 min.	after 3 min.	after 3 min.	after 3 min.
5. Digestive system					
6. Genito-urinary					
Urinalysis, etc.					
7. Skin					
8. Locomotor system					
9. Nervous system					
10. Eyes: Conjuctiva, etc.					
11. Color perception					
12. Vision: Without glasses	Far. Near	Far. Near	Far. Near	Far. Near	Far. Near
With glasses	Far. Near	Far. Near	Far. Near	Far. Near	Far. Near
13. Ears					
14. Hearing	Right ear	Right ear	Right ear	Right ear	Right ear
	Left ear	Left ear	Left ear	Left ear	Left ear
15. Nose					
16. Throat					
17. Teeth and gum					
18. Immunization					
Date of					
19. Remarks					
20. Fluoroscopy					
21. Temperature					
22. Recommendation					
23. Employee's signature					
24. Physician's signature					

INSTRUCTION FOR FILLING

2. *Record main activity and not the official designation.*—EXAMPLE: letter carrier, messenger, field workers, telephone operators, typist, executive, etc.
3. *Include larynx bronchi and lungs.*—Indicate necessity for X-Ray and laboratory examinations when needed and cannot be done due to lack of facilities. Record important history and abnormal findings.
4. Include test for recuperative power of the heart and blood pressure. Record important history and abnormal findings.
5. Include examination for hernia, anus, inflammations of the gall bladder, appendix, and enlargement of the spleen.
6. Indicate necessity for laboratory examinations when needed, and cannot be done due to lack of facilities. Record important history and abnormal findings. When examination is not done for reason of sex record "not examined."
8. Include test for flexibility of joints and reflexes.
9. Record important history and abnormal findings. Test for Argyl-Robertson and Roenberg's signs.
10. } Indicate necessity for specialist examination if symptoms warrant and no facilities
11. } available.
13. Use ordinary conversational voice at 6 meters. Test one ear at a time. Record abnormality as slight, moderate, severe or total deafness.
16. Look specially for pyrorrhea.
17. Record date of immunization against cholera, dysentery and typhoid.
18. Record other abnormal findings, temporary or permanent unfitness for work, contagious condition, etc.
19. Record if employee needs medical treatment, vacation, separation from service or improvement of certain habits.
20. Employee must sign in the presence of examining physician.

26423

NOTE.—All entries must be written in ink. Any erasure or correction must be signed over by the physician.



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laid down in the pamphlet with the illness at hand. Visiting nurses do get into the provinces and *barrios*, but not with the frequency they should. Their work has been productive of much good, but their paucity of number has caused them to spread their services rather thin. Some establishments have had the visiting nurses check on sick-absentees with good results, in both returning the employee to the job, and administering to the patient.

There are several obvious advantages to such an in-plant medical service as seen in this sugar mill. The average Filipino in the province will not see a doctor at the inception of a disease, but always will try self medication first. The next step is to contact a "quack" practitioner whose services not only are costly but inadequate if not damaging.

Young boys often have been seen walking about the yards around their Nipa huts, with week-old bamboo lacerations of the feet, the latter markedly edematous, with the lesion an angry erythematous gash in the middle of a hot cellulitic process. Medical care is sought late, and many residua of previously acquired conditions are seen among the inhabitants as one walks about the towns. There is about a 20% average, of those living in *barrios*, who will consult a physician immediately. The proportion is higher in Manila and other large cities. This medical plan, however, has trained about 50% of the people (or an increase of two and one-half times) to seek medical attention promptly. The people appreciate this readily available service, and have learned to use it to their advantage, and thus benefit plant management. Health promotion is conducted, therefore, by having the worker experience good medicine, and, by *doing*, he learns the correct approach. Health should be a living experience, and many of these workers are feeling the advantages of care for the first time—and determine that their families will follow suit.

Certain immunizing injections are given the employees regularly, as protection against cholrea, dysentery, and typhoid fever. Vaccinations against smallpox are accomplished by visiting representatives of the District Health Officer. All medications are dispensed without charge, and before the war governmental supply stores were well stocked, and had all the newer therapeutic agents.

Reminiscent of the wartime ill-based rumors circulating in the war plants in the States, relative to sterility from welding, mammary malignancy or ovarian dysfunction from riveting etc., the sugar associations have had to fight misinformation on the part of the local population. Many concepts of the harm resulting from the ingestion of sugar have led to repeated educational utterances by the associations. The following are written questions that have required careful, detailed refutation:

1. Does not sugar take the lime from the body and also the teeth?
2. Is it true that refined sugar, not containing any kind of mineral matter and vitamins, is dangerous?
3. Can sugar cause diabetes?
4. Is eating sugar looked upon as dainty and unmanly?

Ideas of this nature have precluded, in part, the increased consumption of sugar in the Islands.

Workmen's Compensation

THE Workmen's Compensation Act of December, 1927, is like unto the Administrative Order pertaining to emergency medical care in industry, in that both the private employer and the government agent shall pay compensation to their employees injured in line of duty. There is no distinction, again, between private and Federal employees, the law applying with equal force to both. All industrial activities are covered by the act, with the exception of agriculture, charitable institutions, and domestic service.

In agriculture, however, those workers employed for the operation of mechanical implements are eligible for the benefits of the Act. Small industries are included, and a different yardstick is used in determining which enterprises are to be covered by the Act. In place of "Total number of employees," the basis used is gross income. All trades, occupations, or professions exercised for the purpose of gain, showing a gross income of over 20,000 pesos shall come under the specifications of the Act. Individuals receiving a salary in excess of 42 pesos per week, or public officers elected by popular vote, and persons paid more than 2000 pesos per annum will not be covered.

In the event of death resulting from an industrial injury or illness within one year from the date of the injury or illness, the employer will pay compensation to the persons entitled thereto; if there is none he shall pay to the person representing the deceased, the cost of burial expenses not to exceed 100 pesos, and also compensation as per established schedules.

The employer is required to pay all medical and surgical costs in connection with an injury or illness incurred by one of his employees, either by providing him with care in the plant hospital, or by paying for the expenses incurred in a private hospital. The liability of the employer relative to these costs, is limited to the amount ordinarily paid in the community for such services, so thus no extravagant claims for medical care costs can be filed. If the employee refuses the medical care offered, or voluntarily obstructs the physician or hospital in rendering such care, it may be interpreted as a waiver of his rights to the care offered, and the employer is liable only for the injury or illness incurred, and not for the medical services attendant thereupon.

In the event of total disability the injured employee will receive, after the first seven days, a weekly compensation equivalent to 60% of his average weekly wages, but not more than 18 pesos, or less than four pesos per week. These payments will not extend over 208 weeks, nor shall the aggregate exceed 3000 pesos. In the event of partial disability, the employee shall receive 50% of the difference between his average weekly wages before the accident, and the weekly wages he could probably earn thereafter. This does not exceed 10 pesos per week, but starts with the first day of disability.

Schedules are provided comparable to those currently used in the States for duration of compensation for various forms of permanent partial disability. After receiving an injury, and during the period of disability, the worker shall "at reasonable times and places" submit to an examination by a qualified physician, designated and paid by the employer. The worker, likewise, may employ a physician of his own choice for such an examination. The employer must be notified as soon after the injury as possible, and claims for compensation must be made not later than two months after the injury, or in case of death, not later than three months.

Employers may guarantee payment of compensation under the Act by insuring his workers in an insurance plan. He must pay the premiums, and any contract that provides deduction from the employee's wages is null and void.

The report forms used by the employer in notifying the Bureau of Labor of accidents sustained by his workers are very comparable to those standard blanks used throughout the United States in compensation records. Claims reported to the Bureau have averaged about 6000 yearly, and those causing greatest dispute, involve the causal relationship of the accident or injury to the development of tuberculosis. As have the cases in the United States, of injury and coronary disease, been carried through the courts, so do these in the Philippines involving pulmonary tuberculosis. From what opinions one can gather, the worker is granted frequently the benefit of the assumption that the injury was etiologically responsible for the development of the pulmonary lesion.

In the case of injured Federal employees, hospitalization is attempted in the free ward of the Philippines General Hospital, but as these facilities are usually filled, other accommodations are paid for by the government. In the sugar mill studied, all the employees were satisfied and pleased with the prompt and complete care rendered them by the Central physician and staff, for injuries and illnesses incurred in line of employment, whether major or minor in importance. The existence of the family care plan allows early care for all conditions, and certain prophylactic advice can be offered, which in the ultimate, will prove of saving to the employer.

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Conclusions

LEGISLATION of the Philippine Islands governing the within-industry medical care facilities is described.

2. The industrial processes of a specific island enterprise, i.e., sugar, are outlined in an effort to show the working environment of the mill employee.

3. The ideal community provided by the Sugar Central offers better living conditions than are found in the average *barrio*.

4. The occupations designated during the milling season are listed to demonstrate the variety of existing jobs.

5. The few occupational health hazards in the sugar industry are discussed briefly.

6. The characteristics of the medical care plan are offered, and they resolve into a complete service at extremely low cost, providing the worker with a high type care not available to the average Filipino worker.

7. Preventive measures practiced by the industry tend to allay epidemics of the commoner communicable diseases.

8. Workmen's Compensation legislation is found to be complete, and patterned greatly after accepted plans.

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BOOKS

Artists at War

Review by
R. M. WATROUS, M.D.

"MEN WITHOUT GUNS," by DEWITT MACKENZIE, Philadelphia, The Blakiston Company, 94 pp., with 137 color plates. $5.00.

DURING the periods in history when the most vigorous art was produced, artists were accepted in the community as men having as useful and necessary a skill as, say, shoemakers or bakers. In the early years of this century, American artists had largely been deprived of this sense of solidarity with the people, and too often could not even earn a livelihood without prostituting their talents to produce the stereotyped and mediocre stuff then known as "commercial art." This situation began to change during the great depression, when the WPA placed artists on the same basis as any other craftsmen and enabled them to earn their bread by their skill. At the same time, certain "commercial" circles became interested in sincere art, and a few fine artists began to be appreciated outside their previously narrow circles. This healthy trend was greatly reinforced by the decision of the Navy to send representative American artists into the battle zones to work *as artists*. The Army followed suit, with results which are well presented in "Men Without Guns." The book contains about 47 pages of four-color reproductions of paintings and sketches made by 12 American artists, and an equal number of pages of text by DeWitt Mackenzie, an Associated Press correspondent.

The drawings and paintings deal entirely with the activities of the Army Medical Corps, the "men without guns" whose heroism and devotion to duty are the central theme of the written text. The depicted scenes range around the world, from training centers in the United States to the great bomber bases in England, to Normandy after D-Day, to Italy, Burma, China, the South Pacific and Saipan, and, finally, to reconditioning and rehabilitation hospitals in America. With a variety of styles, each artist records eye-witness impressions of the great drama of war as he saw it. The results are arrestingly frank —sometimes gruesomely so, as in Lawrence Beall Smith's "Death of a B-17"—as well as touching and homely, as in Joseph Hirsch's sketch of the unshaven corpsman carrying two wounded Italian children, or Franklin Boggs' "Return to the Golden Gate," in which a burly corpsman carries a paralyzed soldier to the upper deck so he may grin happily at his first sight of home. In all the paintings, there is a vigor and an integrity born of the conviction that the artist had his own essential part to play in the vast human drama which was unfolding around him; in the face of so much self-sacrifice, these non-military painters felt an obligation to risk everything that the common soldier risked so that they might give a more faithful account of the mission.

The text by DeWitt Mackenzie which occupies approximately half the volume is a straightforward piece of reporting. As much as possible, the author quotes the various people he interviewed: artists Boggs, Robert Benney, Joseph Hirsch, Lawrence Beall Smith and Howard Baer; Generals Kirk and Grant. Mackenzie contributes an introductory chapter describing and praising the work of the medical corpsman, and supplies the explanatory passages required to connect the interviews into a coherent story. There is very little in the story of Army Medicine that the average physician does not already know, but the interviews with the artists are of real interest, and give added meaning to many of the paintings. Each plate is accompanied by "official" captions, furnished by the Public Relations Branch of the Army, and written by Major Clarence Worden; these are written with unusual clarity and good taste.

All the color plates in the book have previously been available to physicians through the medium of *What's New*, a magazine published by Abbott Laboratories. For several years before the war, this pharmaceutical company had made extensive use of fine art in its advertising; with the advent of war, it commissioned the artists represented in this book, as well as many others, to paint and draw in the general interest of the war effort. The paintings and sketches were subsequently presented to the United States Government. The comparatively modest price of the book is probably explainable by the fact that the engravings had already been used to print the magazine mentioned.

Anyone interested in contemporary American art will be glad to have assembled in one volume such an unusual collection of work.

The "Nervous" Veteran

"THE ADJUSTMENT OF THE NERVOUS VETERAN, by MEYER BROWN, M.D., PH.D., Zurich Insurance Companies, Chicago, Illinois, 52 pp., 1945.

IN THIS latest publication from the Zurich Insurance Companies, DR. BROWN has presented a subject of great interest to industrial physicians as well as to management. It is a topic which unfortunately has been associated with much prejudice and even more confusion but which demands our attention simply because it is encountered daily in almost all industrial organizations. Despite the fact that this publication was written for management at all levels, industrial physicians may find it profitable as well as interesting to read because of the clarity and simplicity with which it discusses a complicated subject.

All veterans returning to industry from military service have an adjustment to make, both on and off the job. For most of them this adjustment may be simple enough so that their working ability may not be affected appreciably. But some of these men and women have difficulties which disturb them sufficiently to impair their productive powers on a job. Finding a place to live, accepting family responsibilities, adjusting to competitive work, or merely adapting to a full day at steady work may prove to be a serious obstacle to a

This booklet may be obtained by writing the Zurich Insurance Companies, 135 S. La Salle Street, Chicago 3, Illinois, on company or official stationery and enclosing 10c to cover mailing costs.

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A worker with sore, chapped hands sometimes makes the foreman sore too. The job suffers. And yet rough, dry or chapped hands frequently result from an effort to get rid of unavoidable industrial grime.

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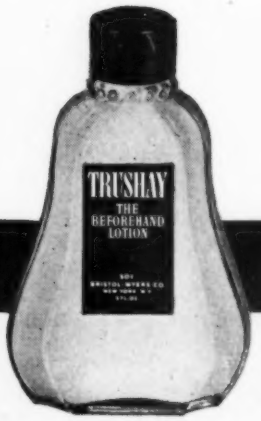

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return to normal working habits and abilities, even in the veteran without a nervous or mental disease.

The veteran with a neuropsychiatric disorder finds the problems of adjustment to civilian life more difficult than other veterans. As DR. BROWN points out, his ability to cope with those difficulties which beset everybody returning to civilian life is lessened because of his symptoms. Furthermore, he is handicapped by confusion, ignorance, apprehension, prejudice and even cruelty from those he is to work with and for.

After introducing the "nervous veteran" as a group, this publication considers the four major varieties of disorders into which neuropsychiatric patients are conveniently classified, namely: the psychoneuroses, the psychoses, the personality disorders, and the mental deficiencies. Each clinical group is defined and briefly described in terms intended for the lay reader. The description is followed by a consideration of the prognosis, treatment and industrial implications of the illness. Among the latter we find pertinent remarks dealing with placement, management, indications for professional assistance and indications for exclusion from work of persons in the four categories discussed. Case histories illustrate the disorders.

A chapter is then devoted to considering specific problems which are apt to be most troublesome in the veteran with a nervous or mental disease. Among these are arguments with fellow workers or supervisors, resentment on the part of the veteran, indecision as to type of work most suitable for the returning serviceman, lack of interest in the job, absenteeism, accident proneness, alcoholism, etc. Perhaps the reader will obtain a little more insight into the causes of these problems when he increases his understanding of the neuropsychiatric disorders he may encounter in employees.

The last chapter is entitled "What Can Management Do About the Nervous Veteran." It contains advice, both specific and general in nature, which is likely to supply guidance to many persons now using rule of thumb or no rules at all. Of course, each employee is a specific problem, but management and industrial physicians may profitably ask themselves such questions as: Is this man properly placed? Is additional professional advice needed? Can anything be done to manage this man more effectively? Are serious errors being committed in the handling of this case? No doubt this booklet and others like it cannot answer these questions for every veteran employee with a neuropsychiatric disorder, but increasing our awareness and understanding of these disorders will certainly be of some assistance.

With clarity, interest, and with a fine balance between too much and too little emphasis on an important subject, the author has achieved his aim. It is worth noting incidentally, that the contents of this booklet apply to a large extent to the non-veteran worker as well as to the veteran.

General and Plastic Surgery

Review by

EDWARD P. HELLER, M.D.

GENERAL AND PLASTIC SURGERY WITH EMPHASIS ON WAR INJURIES, by J. EASTMAN SHEEHAN, M.D., Professor of Plastic Reparative Surgery, New York Polyclinic Medical School and Hospital.

THIS 345-page volume appears as the World War II counterpart of W. W. Keen's volume "The Treatment of War Wounds" which appeared in several editions during 1917 and 1918. It is published by Paul B. Hoeber, Inc., the medical book department of Harper and Brothers and is printed on a very good quality of paper, well indexed and profusely illustrated. It is definitely a volume for the traumatic surgeon, civil and military, and not a text for students.

All of the recent advances in bacteriostasis and chemotherapy are discussed and evaluated, and the reports and illustrations of Hamilton Bailey, Trueta, Maingot, Schlesinger, and Fletcher, and others are extensively used. One is impressed with the author's desire to choose problem cases for illustration, as for instance his care in describing by word and illustration the handling of maxillofacial wounds, of hand and foot infections, and the care of extensive burns.

All of the modern devices for saving life are adequately covered in the emphasis upon treating burns as open wounds, the use of plasma infusions in burns, shock and visceral injuries, the importance of wound excision for elimination of devitalized tissue, and the recognition of the hazard in blast and crush injuries.

The continuing importance of the Thomas splint, the early closure of sucking wounds of the chest and the criteria by which one may judge cases requiring amputation are matters which differ little in World War II from those of World War I. The use of massive plaster shells, chemotherapy and adequate early transportation are advances in treatment to be noted in this connection. Ambrine, bipp, Sinclair's glue and dichloramin-T of 1914-18 have given way to the modern petrolatum gauze or Colebrook's emollient and bulk pressure dressing, "C.T.A.B." skeletal traction, sulphonamides and penicillin of 1941-45.

Since much space is devoted to plastic surgery I have asked my associate, DR. JOHN GASKINS to express his opinion with specific reference to this phase of the book. It is his feeling that this text presents well the scope of the field, without going into extensive detail as to the possibilities of plastic reconstruction. He agrees with the reviewer that it is not a text for beginners and students, but quite adequately presents the procedures that experience has proved to the author to be the most trustworthy.

Allergy

Review by

OSCAR L. LEVIN, M.D.

ESSENTIALS OF ALLERGY, by LEO CRIEP, M.D. Octavo of 381 pages; illustrated. Philadelphia. J. B. Lippincott Co. 1945.

THE field of allergy is well covered in this excellent book. DR. CRIEP has presented present day concepts and knowledge of allergy with thought and clarity. He discusses the various topics related to this field in detail and adequately outlines special techniques and their limitations. The facts of allergy are interpreted properly with no deviations toward the fancies and fallacies that permeate the general literature of today on hypersensitivity. The book is intended primarily as a manual for the undergraduate medical student as well as for the practicing physician. However, the specialist in the field or in related sciences will also find topics of interest and information. The subject matter is in outline form for the sake of conciseness. No lengthy controversial discussions divert the reader, although divergent views are mentioned briefly. Each chapter is followed by a series of case reports drawn from the writer's practice. These are intended to illustrate essential practical considerations. By these means, an effort is made to emphasize the diagnostic and therapeutic methods which are of use in the management of allergic patients. Fortunately, the great majority of DR. CRIEP'S patients recovered after suitable study and treatment. It should be emphasized that not all patients suffering from allergic diseases respond so well. Not infrequently, the causative factors as well as the proper therapeutic measures are elusive, even to the expert. To recapitulate, it may be stated that DR. CRIEP has carried out his initial aim with clarity and precision, namely, the writing of a thorough and sound textbook on the fundamentals of allergy.

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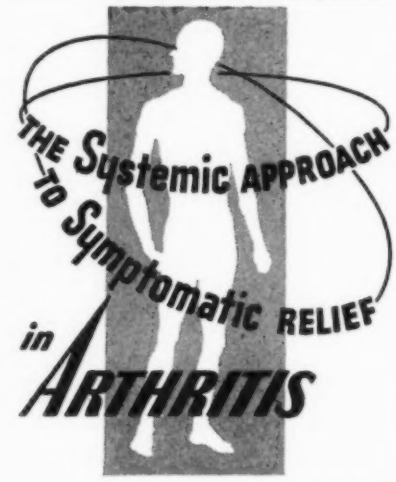
INDUSTRIAL HEALTH and DISEASE

The Preliminary Physical Examination for Industry

VICTOR BRITO A., M.D., and AGUSTIN LA CORTE, M.D.,
Creole Petroleum Corporation,
Caripito, Monagas, Venezuela

IN VIEW of the increased number of socio-medical protective measures enforced under the present Venezuelan Labor Law, an increasing number of general practitioners is needed to care for the health of large groups of industrial workers. For physicians entering this field, especially those recently graduated, we find it useful to have a standard guide to be followed in this most important industrial medicine procedure, the preliminary physical examination.

From Standard Oil Company of New Jersey's *The Medical Bulletin*, 6:4, 242-257, October, 1946.



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In preparing a guide for Spanish speaking doctors we used as our basis the pamphlet "Instructions for Medical Examiners." Using their accepted standards of physical fitness for applicants and causes for rejection, we have applied these instructions, formerly used in Venezuela only for the foreign staff, to the preliminary examination for industry of all laborers and employees.

Our emphasis on the preliminary examination and the manner in which we have applied these instructions make up our new guide. It gives the medical examiner a definite procedure, the accepted standards of physical fitness for industry and a uniform manner of recording the findings in exact detail.

Preliminary Examination

THE resources of medical science specialized in industrial medicine constitute one of the greatest benefits received by the worker under the Venezuelan Labor law. To cure the sick employee is an obligatory benefit in industrial medicine; however, the maximum benefits granted him are in the field of preventive medicine. It is of even greater benefit than sickness recovery to prevent the worker from contracting disease, to prevent the aggravation of a previous affection due to his work or to prevent accidents to himself and his companions because of organic or functional deficiencies.

The examining physician can guide the office worker with an optical defect to have his deficiency corrected with appropriate glasses. He can advise the change of occupation for a chauffeur with a limited field of vision before a serious accident occurs to him or his companions. The examination can segregate the laborer who suffers from an incipient tuberculosis unknown to himself and start his treatment for recovery. These are benefits of the preliminary examination. Its importance as the first protective step benefiting the worker must be realized as such by the examining physician.

Procedure and Criteria

PREVIOUS HISTORY: In view of the influence that is exerted on the health of the applicant by past diseases, operations or accidental injuries, it is necessary to question him carefully as to his pathological past. In many cases this will give the physician vital information that might otherwise be overlooked. It will help him to determine whether or not the work contemplated could damage the health of the future worker.

ORGANS OF THE SENSES: All the organs of the senses are important to the worker, but sight and hearing are indispensable. Their being in good condition is necessary for his efficiency and his own protection from accidents, as well as that of his companions.

The ideal condition is one hundred per cent functioning of these organs, but work may be performed efficiently and without risk within limits determined by the nature of the work.

EYES: The medical factors to be determined are acuity of vision and, in special cases, field of vision and color perception.

1. Work requiring predominantly mental effort (executives and office employees):

The applicants for this type of work should have a minimum acuity of vision of 20/30 in one eye and 20/40 in the other (Snellen or the equivalent if other charts are used). This degree of acuity may be attained through the use of appropriate corrective lenses.

2. Work requiring predominantly physical effort (workers in general):

Applicants under this classification should have an acuity of vision of at least 20/100 in each eye without lenses.

3. Conductors of automotive units (automobiles, cranes, locomotives, boats, etc.):

These applicants should have a minimum acuity of vision, without lenses, of 20/40 in one eye and 20/100 in the other, but their vision should be corrective to a minimum of 20/30 and 20/40, respectively. These applicants should also be examined to determine field of vision and color perception.

4. Aviation Pilots:

These applicants require a special examination by an oculist.

The Snellen chart is the one most widely used to determine acuity of vision. Placing the applicant at a distance of 20 feet (6.1 meters) from the chart, he is made to read with each eye every one of the letters in each line, up to the smallest one read correctly. At the end of each line the acuity of vision is expressed in the form of a fraction, the numerator of which represents the distance and the denominator the degree of acuity.

The chart should be adequately, although not intensely, illuminated. To cover one eye while the other is being examined, a dark piece of cardboard is used, rather than the hand; this avoids the pressure exerted by the hand on the eyeball and the reading with both eyes through the interdigital spaces. Some persons learn the letters beforehand in order to pass the examination. Among other procedures, the most simple manner of exposing them is to make them read the letters skipping from one to another irregularly or to read them in reverse.

The field of vision is determined approximately by placing the applicant in front of the examining physi-

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cian with his back to the source of light and directing him to fix the eye to be examined upon the opposite eye of the examiner, which should be at a distance of 2 feet (60 cms.). The eye not being examined and the other eye of the examiner should be closed. The examiner then moves his hand with moving fingers from various parts of the periphery midway between himself and the applicant on a plane with his face until the applicant indicates the point at which he can see the fingers. The test is made first with one eye, then with the other to determine both fields of vision. When the points are found on the imaginary horizontal line passing at the same level of the eyes of the applicant (diameter of the circle) there is between them approximately half a circumference. The field of vision is normal when a person looking straight ahead can see objects located at right angles. For general working requirements the examination of the field of vision in a horizontal plane is sufficient. A person fit for work should have a field of vision of at least 2/3, or 60° on each side.

The applicant should be able to distinguish colors. It is very simple to investigate this condition by the use of painted objects. Color blindness is a cause for rejection of applicants for laboratory technician jobs and those requiring the driving of automotive units.

Serious ocular disturbances, such as glaucoma, leukomas of the pupillary area, cataracts and atrophies, and the physical or functional loss of one eye are causes for rejection. An eye with a minimum acuity of vision of 20/200 is considered industrial blindness (unfit for industry). An overdeveloped pterygium, especially if it invades the cornea, is cause for temporary rejection. The applicant should have it removed before submitting to a second examination.

EARS: The acuity of hearing is determined by placing the applicant at a distance of 20 feet (6.1 meters) from the examiner who, with a natural and soft voice, will question him. If these questions are unanswered, they are repeated, diminishing the distance by three feet (one meter) each time, until the examiner is sure that he is heard.

The acuity of hearing is expressed by means of a fraction whose denominator of 20 feet (6.1 meters) represents the distance for normal hearing, and whose numerator represents the distance at which the applicant is located when answering the questions. A minimum acuity of hearing of 3/20 (or 1/6) is required for the acceptance of the applicant.

Acute otitis is a cause for temporary rejection, until cured. Persistent chronic otitis, or any other serious affection of the ear, is cause for permanent rejection.

LOCOMOTIVE APPARATUS: Under the action of the nervous system, the members, with their faculties of support, locomotion, prehension, equilibrium, direction of movement and appreciation of size, weight and form, are the organs which directly or through the handling of mechanical instruments or machines, do the work. For the carrying out of their functions, the complex mechanism of bones, muscles and articulations must be in perfect physical and functional state. Integrity, coordination, strength and movement are the factors to be tested in examination.

Diseases of a nervous origin, atrophies, osteitis, arthritis, ankylosis, deformities and amputations which affect the above mentioned factors in a serious way, interfering with the functioning of the members, are causes for rejection.

Special care is required in the examination of the hands, "the second brain of the worker." The lack of the thumb, or of both the fore and middle fingers or their ankylosis, making prehension impossible, are causes for rejection.

Persons with weak, defective or flat feet are incapacitated for strenuous physical work.

PHYSICAL APPEARANCE: Industry does not require athletes, but a physical constitution physiologically too weak for work is sufficient cause for rejection.

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Pericarditis, myocarditis, endocarditis, a history of angina pectoris attacks, heart block, fibrillation, hypertrophy of the heart, dilatation of the aorta, aneurism, arteriosclerosis, permanent hypertension above 150, varicose veins and peripheral arterial disease are causes for rejection.

RESPIRATORY SYSTEM: The importance of the examination of this system is obvious, especially for discovering tuberculosis. The common causes for rejection are: tuberculosis, bronchiectasis, pleurisy, severe chronic asthma or bronchitis, sinusitis, and nasal obstruction by polyps or rhinopharyngeous tumors. Fluoroscopic examination of the thorax should be done where facilities are available.

DIGESTIVE SYSTEM: The harmful influence on the general health of focal infections of the tonsils, teeth and gums is well known. Diseased tonsils, peridental abscesses, dental necrosis and alveolar pyorrhea are affections which must be treated before granting the applicant a second preliminary examination. At least six opposite pairs of dental pieces are required to permit a minimum mastication; otherwise, the applicant should provide himself with appropriate prosthesis.

In persons with histories of serious digestive trouble, the examiner must bear in mind the possibility of cancer, digestive tract ulcers, ulcerous colitis, cholecystitis, cirrhosis, amebiasis, etc.

Rectal stricture is a definite cause for rejection. Hemorrhoids producing symptoms, as well as those ulcerous or bleeding, should be treated before applicant is allowed to work.

GENITO-URINARY SYSTEM: The investigation for the existence of disease in the genito-urinary system is of the utmost importance for the protection of the individual as well as that of his fellow workers.

Venereal diseases (acute gonorrhea and chancres) which entail extragential contagion hazards, and their complications (cystitis, orchitis, arthritis, urethral stricture), which might be aggravated by work and time, as well as clinical evidence of their having become chronic, are causes for temporary rejection until cured, or permanent rejection if serious organic lesions are involved.

The existence of nephritis or other serious affections of this system are causes for rejection. Urine examinations, chemical and microscopic, and blood Kahn test, or other similar reactions, are obligatory to confirm diagnosis or to guide the physician in the later treatment of the sick employee. The urine examination permits the early discovery of diabetes, the existence of which might have been ignored by the applicant, and which is also a cause for rejection.

NERVOUS SYSTEM: All the care taken in the examination of the nervous system, the center and guide of all mental and physical activity, is never enough. The diagnosis of a serious affection of the nervous system, besides being of benefit to the applicant by providing an opportunity for the early treatment of the disease, is the greatest protection for the worker and his companions against their common enemy—the industrial accident. Dementia, psychoneurosis, mental deficiency, epilepsy and diseases interfering with the mental faculties and motility, are cause for rejection.

If the examiner has the slightest suspicion of nervous disturbances, the applicant should be referred to a specialist for confirmation of diagnosis. Alcoholism and drug addiction are incompatible with industrial work.

ABDOMEN: Although this region is examined in the digestive tract examination, it should be especially reviewed as a whole, to investigate for tumors, weakness of walls, hernias, etc.

Advanced splenomegaly due to any reason is a cause for rejection, especially that due to malaria, because of the fragility of the organ and the seriousness of its rupture.

Hernias of all kinds, hydroceles and large, painful varicoceles, are also causes for rejection, as well as wide inguinal rings; this latter condition should not be considered as cause for the rejection of applicants for office work, but a notation should be made on the physical examination record.

Since even after surgery hernias have an unavoidable percentage of recurrences, it is necessary to wait for a designated period before the applicant is finally accepted.

This period should be of at least three months for the umbilical or epigastric hernia, six months for the inguinal hernias and from six months to one year, according to the seriousness of the case, for ventral hernias.

GLANDS: The thyroid, especially, requires the attention of the examiner, since its diseases greatly affect

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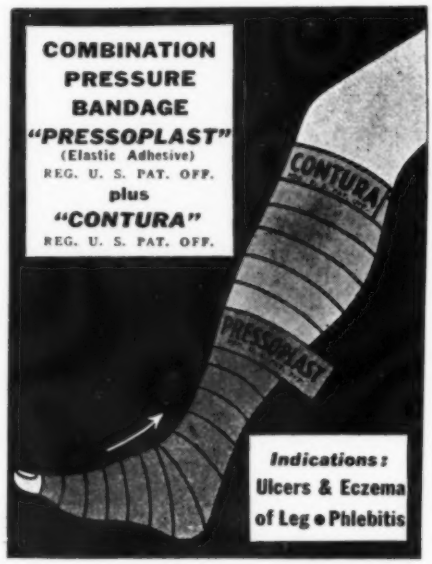

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The typhoid inoculation, and inoculation against yellow fever, are not compulsory under the Venezuelan law, but the internal regulations of an industry may require them as employment conditions for certain groups of workers. This would be the case, for example, of the seismograph personnel, geological crews and the exploration parties.

Physical Examination Record

IN ORDER to avoid misunderstandings in the examination, as well as to standardize the procedure when there are several examiners, a definite and complete medical form should be followed in all cases.

The form previously used did not meet the needs of the laborer's examination, because the information on it was incomplete. Owing to the lack of detailed information the examining physician was not obliged to make a complete examination.

Every detail needed to determine physical fitness for industry is incorporated in the new form presented here. It provides accurate records in case of legal procedure. It forces the examiner to make a complete and more efficient examination.

Summary

BY FOLLOWING an accepted standard procedure a more thorough examination is assured every applicant, with the advantage of increased efficiency of the examining physician. This procedure of a uniform examination with an established criteria of physical fitness for industry and a uniform method of recording the findings leaves no margin for errors or incomplete examinations.

Industry and the General Practitioner

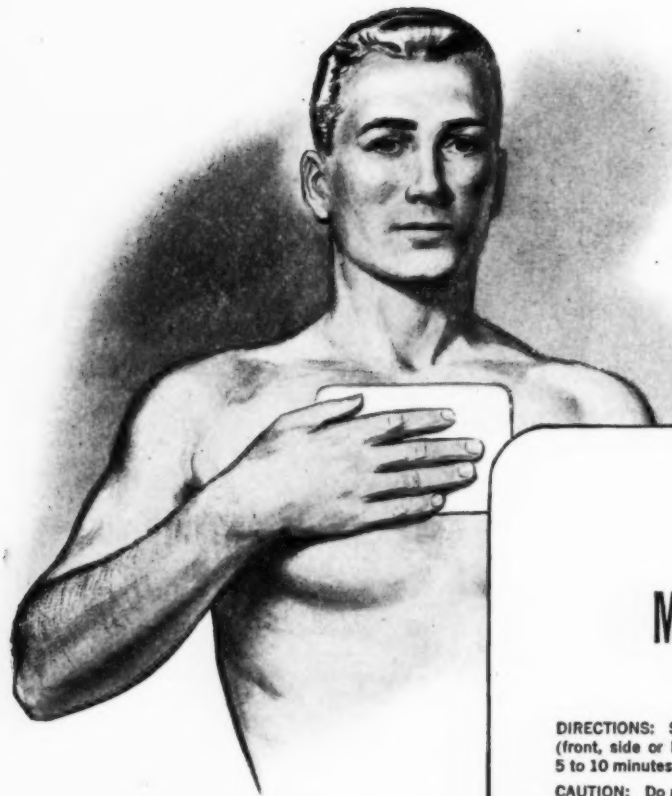
EUGENE W. BOGARDUS, M.D.,
Chairman, Industrial Health Committee

MODERN industry is a mass activity. Modern medicine is still an individual effort. To obtain results in industry, the medical practitioner must apply his knowledge to individuals and to individual problems in order to improve the health of a group. Industrial activity tends to overlook the results of individual craftsmanship and to expect results from groups. The physician is somewhat bewildered by the contrast to his general practice.

Yet it is the general practitioner who must fill the needs of medicine in industry. This is true because the greater proportion of industry is located in plants of 500 employees or less and cannot support a full-time medical man. The general practitioner who is attached to an industrial program may be chosen for a number of reasons. He may be located near the plant. He may be the family doctor for the employer. He may have received a number of cases from the plant for first aid in his office. He may be doing surgery and become known to industry in this connection. Whatever the reason for his being in industrial medicine, he is in a position to be of service to the employees, to the employer and to the medical profession.

The first problem to be settled is not the rate of compensation, or the hours of attendance, but his position in relation to the organization setup, where his responsibility lies, and how much freedom he is permitted in his medical judgment. Any doctor who is entirely controlled by the employer or by the employees in setting up his program becomes necessarily an accessory to the group for whom he is working. His position should be autonomous and that of a referee rendering independent opinions for

From *Westchester Medical Bulletin*, October, 1945.



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CAUTION: Do not keep plaster on long enough to blister the skin—never over 15 minutes. If blistering occurs because plaster is left on longer than 15 minutes, apply Johnson's Baby Cream or Petroleum Jelly to soothe the irritated area. When used on children or adults with sensitive skin, place a layer of wet gauze or cloth between plaster and skin.

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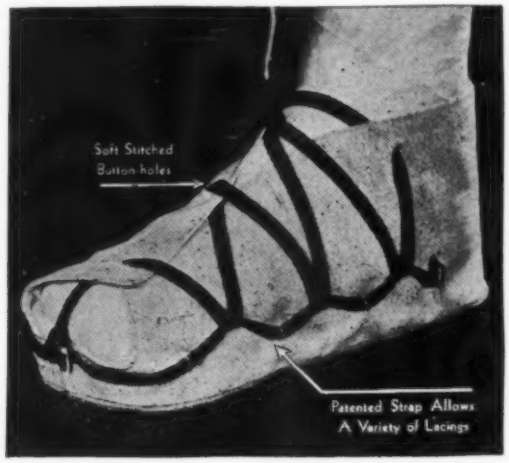

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the welfare of all concerned. He should be entirely free from discussions involving lost-time pay, compensation losses, or other financial considerations which might influence his medical judgment. On the other hand he should remain conscious of general improvements which might raise the level of employee health and result in production increases or savings in cost.

Industry measures its accomplishments in terms of dollars and cents, or in production figures. Medicine cannot measure its results in the same way. The industrial physician is always under pressure to justify his procedures in terms of industrial accomplishment. He cannot do this. His aim should be to provide a healthful environment in which to work and to raise the health status of individual employees for the protection of themselves and their fellow workers. His is essentially a service activity. It is true that he can tabulate visits to his medical department, make reports on physical examinations, first aid rendered, and nursing activities, but he cannot evaluate the accomplishments of this service in terms of quantitative units. He can do better on the qualitative side by rendering careful and competent service which is reflected in the satisfaction of both the employees and the employer.

The industrial physician must render first aid. He must channel patients with injuries to their family physician. He must report injuries to employer and to labor bureaus. This type of work is well established and runs without too much confusion. He is responsible for minor illnesses which occur during working hours, trying to keep employees on the job if it can be done without aggravation of the illness. Sometimes a short lost-time illness will prevent a longer serious illness and he must be careful in his decision at the beginning of an illness rather than later.

The industrial physician should be familiar with the sanitary conditions of the plant, of its heating, lighting, and ventilating facilities, and of any nutritional program which is conducted on the plant location, whether a concession or a plant operated function. Any health hazard of the industry must be supervised. Many times the suggestions of a medical man can save serious health hazards from developing or becoming chronic. He should know of the safety factors which are in operation in the plant, and should have a mechanical understanding of their operation.

The physician must perform his duties with a minimum of confusion and interruption of industrial activity. He must initiate medical changes without disrupting the rest of the picture. He must be a diplomat, cultivating the good will of employees and retaining the confidence of management. He must sell health to employer and employees and yet keep the friendship of his brother practitioners in the community.

The amount of therapeutic medicine which is permitted in a plant is dependent upon available facilities in the community around the plant. Isolated plants may have to provide full medical treatment. Generally, the less medicine practiced within the plant, the better the result. The nurse must work under written orders from the doctor. The doctor should approve in writing the medicine which is dispensed each day. This will prevent too much symptomatic treatment from creeping in. The aim of the doctor is to discover medical defects and have them corrected permanently, as far as conditions permit. The practice of allowing a chronic case to continue to visit the medical department for an indefinite time is not good medicine.

In his pre-employment examinations the aim should not be to obtain perfect physical specimens but rather to obtain qualified workers who can be trained to perform their duties efficiently without aggravation of existing defects. The use of rehabilitated workers will become a significant part of any industrial activity of the near future. The industrial physician should be prepared to evaluate physical handicaps in terms of employment and protect employee health.

The medical department should report only to top organization officials as a matter of good public relations.

Anything which binds his decisions to the give and take of routine employment problems naturally limits his effectiveness by placing him in the sometimes confused arena of management-employee relations. He should be outside the recriminations which could and do arise from dissatisfaction with the status quo.

The industrial physician is responsible for anything which may affect the health of the workers.

He becomes a father confessor—a medical judge.

His decisions should be of the common sense variety and should be final. He should be respected by all concerned, and the type of service he gives will determine the place he holds in the minds of employer, employee and community.

The Industrial Medical Centre

—(With Particular Reference to Pre-Employment and Periodic Medical Examinations)—

DR. EMMET DWYER

IT IS PROBABLE that in a general way almost all of us appreciate the advantages of medical care. We agree that it is a good thing and, when disease or accident strikes, the average person very quickly places himself under medical treatment and cooperates with his doctor in trying to obtain a cure. Indeed, for a good number of years past, we have gone even further in our search for health. "Well-baby" clinics have had generous attendance, more and more pre-natal and post-natal care has been demanded for our wives, and pre-payment health services, whether through insurance companies or by way of non-profit organizations, such as The Manitoba Medical and Hospital Service Associations, have become increasingly popular. But, so long as we feel well, you and I do not, as a rule, give very serious thought to the fact that health is a positive thing and that it is desirable to place more stress on its preservation whilst we have it, than on its recovery after we have lost it.

It took a great war fully to convince our governments and our industries that their greatest asset was their healthy trained manpower. It was the function of National Selective Service to utilize manpower to the best advantage, and in doing so to provide the Armed Services with as large as possible a body of physically, mentally and morally fit men and women. I haven't Canadian figures at hand but the American Army and Navy totalled 12,000,000 men. In raising this force, well on to 5,000,000 men in the 18 to 37 year old group were rejected because of failure to meet minimum standards of fitness. It is of interest to note, also, that in rural areas, where public health and medical facilities have always been scarce, rejection rates in the 18 and 19 year old farm youths were 41% compared with an average of 25% for other groups.[1]

Under the stress of war, and operating with a personnel that necessarily included those not fit for military service, industry and government quickly provided industrial welfare and health services along the most modern lines. Action was taken to ensure safer and more healthful working conditions. Washrooms and lighting were improved, dangerous noise conditions were eliminated, and toxic vapours and dusts were brought under control. Pre-placement medical examinations were encouraged for the purpose of assigning questionably fit men to the most suitable and safest jobs available for them, and, finally, health services and periodic medical examinations came into wide use. These installations in every instance demonstrated their value and showed a dollar and cents gain to the employer and employee.[2]

However, organized labour sometimes looks with suspicion on such services when provided by management, feeling that workers who exhibit defects might be at a disadvantage in the labour market. It is encouraging to know, however, that this attitude is changing.[3] It has now come to be realized that there are really very few workers who would, as a result of periodic examinations, have to seek other employment, and it is usually understood that any such reason for protest is more than offset by the protection afforded the great majority.

At the present time, labour is struggling with fundamental social problems having to do with the welfare of the people. Many of these problems present medical angles, and only through wise medical guidance can the best solutions be obtained.

The medical treatment centre in industry provides a most important avenue of approach to the solution of these problems. The industrial physician learns from his patients of unsafe and unsatisfactory working conditions and through his direct dealing with management is in a favorable position to recommend strongly for any indicated corrections.

The industrial medical service can, of course, be useful in an over-all way, only if it has the confidence of both labour and management. Many different yardsticks have been suggested to measure the value and efficiency of an industrial medical centre,[4] but I feel that the best single measure of its success is the extent to which it is used by the employees. If an industrial medical service is giving good medical care and advice to the company's employees there should be a steady increase in its volume of work.

Our own experience here in Winnipeg in The Canadian National Railways and Trans-Canada Air Lines is of interest in this connection.

Our local Canadian National Treatment Centre was opened in the year 1930. Its purpose was to improve the health of the employees by the early detection of non-occupational illnesses, as well as for the care of emergency occupational conditions. It was felt to be important, in furthering our aims, that the worker should have ready access to the medical department for the diagnosis of even apparently trifling conditions which may at times really represent the initial stages of more serious trouble.

The idea was, too, that when the men, through contact with the treatment centre, realized the benefits of good medical care and that they were not, in any way, to be exploited, their suspicion and antipathy to a medical guardianship could be overcome and that, in due course, they would come to favor periodic physical examinations, as well as pre-employment and other standard protective examinations.

With those objects in view, the company was prepared to have our various clinics operate at a financial loss, if necessary, in order to gain the confidence of our employees. Actually, as a result of our also treating workmen's compensation cases, and taking over many necessary special examinations, it became possible to further the co-operative relationship between the company and its personnel through the establishment of an efficient medical service, without incurring any such loss.

Almost from the opening of our Treatment Centre it was evident that it would be a success. Within a few months the increasing confidence of the employees was very noticeable. From a tentative visit about some

Lecture No. 9, University of Manitoba, Evening Institute, Industrial Safety Training Course, Winnipeg, January 14, 1945.

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1. J. A. M. A., *128*:475-479, June 16, 1945.

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minor ailment, and a hesitant consent to the most superficial examination, we were soon called on to advise on all sorts of serious conditions and the most thoroughgoing form of examination was not only accepted but requested.

These health consultations brought the benefits of early diagnosis of potentially serious disease and often protected, not only the company, but also the individual or his working associates from the hazard of his engaging in an occupation which might be dangerous to him on account of the physical condition disclosed.

It was only a matter of time until the representatives of the larger railway labour organizations came to cooperate fully in the establishment of our periodic medical examinations, and, when Trans-Canada Air Lines came into the picture in 1937, it was a natural transition to carry on these examinations amongst all of its employees.

Naturally enough, there are individuals and even groups whose suspicions of such a service "die hard." But, in answer to the questions "Do the employees like the service?"—"Do they find it valuable?"—"Are they suspicious of it?"—I think the most enlightening reply is to say that whereas in the early 1930's our local medical staff consisted of one doctor, we now have four and expect to add to this number.

There are places, notably in the West Coast shipyards, where labour groups have continued to oppose any type of pre-placement or periodic medical examination.

During the war years there were about one million persons in the shipyards on the perimeter of the United States. Absolute necessity forced the shipbuilding industry to employ the physically handicapped and to make the maximum use possible of man and woman power through the elimination of lost time due to preventable causes. The Maritime Commission and The Navy, working with the shipyards, felt that physical examinations were an essential feature in the program.

A recent three-year study of five shipyards on the Gulf and East Coasts, where pre-placement examinations were conducted, in comparison with five shipyards on the West Coast where such examinations were not permitted shows, amongst other comparable findings, that though only about 3% of applicants were rejected as a result of pre-placement examinations, the average number of serious injury cases per month was about three times as high in yards without examinations as in yards with pre-placement examinations.[5]

Probably, I should emphasize here, that the purpose of pre-placement examinations is *not* to secure only 100% fit men and women but to ensure placement of the worker at a job where he can steadily perform his work without undue impairment to himself or his fellow workers. In the transportation industry, much of the work is moderately heavy and involves certain risks, and we cannot assign to such positions physical or mental misfits who might be undue hazards to themselves, to their fellow workers, or to the travelling public. In this connection, I could cite many interesting case reports from my own files but perhaps a conclusion to be drawn from the experience of the Canadian Armed Forces in taking chest x-rays of all recruits, provides material for serious thought. Study of the findings suggests that in Canada there are possibly 40,000 unknown spreaders of tuberculosis, and it is one of the purposes of pre-employment examinations to protect men and women from coming into work contact with these people.

Having certified a new man as fit for a particular job, it then becomes the purpose of the industrial medical centre to keep him fit, and, if necessary, to encourage him to correct any factors of ill health with which he may be troubled. Such aims are accomplished, at least in part, by means of periodic health examinations.

Defects noted at these examinations are drawn to the individual's attention at the time and a follow-up letter listing the disabilities is subsequently mailed to him at his home. The defects we detect in this way represent, as you will easily realize, a cross-section of all the ills to which flesh is heir and our organizations take considerable pride in knowing that many of our employees are today alive and well and engaged in their usual or in some other suitable occupation because of the fact that a periodic examination, or a voluntary consultation at our Clinic, enabled us to give them appropriate advice in good time in connection with conditions such as heart disease, kidney disease, diabetes, or other ailments amenable to treatment.

There are tangible local statistics, too, strongly to suggest the value of such a service. Our own Manitoba Hospital and Medical Service Associations have found that in employed groups where a medical service operates, their costs are sizeably less than in the industrial groups which receive no regular medical service, and, of course, this saving to the Associations represents less illness, and less severe illness, to the employees in the groups which have a plant medical service.

Right here I should, perhaps, make clear to you that all the information we assemble on a man is held strictly in confidence, even from his supervisors to whom any necessary report on his condition is made only in the terms "Fit" or "Not fit." It is only on rare occasions, e.g., where the welfare of other employees, or an unjust claim for injury, might be involved that any modification of this rule occurs.

A medical program in industry must, of course, fit in with the company's administration and also satisfy the employees. Successfully to accomplish both these things may at times present difficulties, but by recognizing conditions as they actually exist, not as they might be, by keeping out of disputes, and by giving first-class medical care and honest advice there is every reason for the doctor in industry to look forward to pleasing the great majority of those interested in his service.

The work of the industrial medical centre must tie in, too, with the firm's direct accident prevention program, with its first aid service, and with its sanitation work, as well as cooperating with public health agencies in programs of tuberculosis finding and venereal disease control, and, of course, the medical care of the individual worker is at all times the basic concern of the doctor working in industry. Just how far an industrial medical centre should go in treating employees is still a debated question. The scope of the service must vary greatly depending on various factors, such as the size, the location, and the type of business the firm engages in. We in The Canadian National and in Trans-Canada try to keep to the middle of the road. We offer full care of industrial accidents and illness, and, in addition, treatment of ambulatory illness only, partly to try to keep the worker on the job but also to further the patient-physician relationship. As a matter of fact, it is, in actual practice, difficult to refuse to give treatment for illness at a company health centre. There is a constant demand from the employees for such treatment and its value is apparent to all concerned. Moreover, the borderline between the advice given to prevent illness and that given to relieve symptoms already established

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is a hazy and ill-defined one. However, we do not follow the sick employee into his home, but, instead, refer him to his family physician with whom we are always ready and anxious to cooperate whether by communicating our findings and opinions to him, or, by trying to get special consideration at work for his patient when such is indicated.[6]

Now this matter of special consideration for the handicapped brings us to the subject of "Rehabilitation." Few problems have taken greater hold upon popular imagination than rehabilitation. It required the sickness and disabilities incidental to war to develop a national awareness of the size and importance of the problem, though, in truth, it was and is a peacetime problem of similar proportions.

In our organization we have for many years now had an active interest in the subject. We have a System Committee and Regional Sub-Committees made up of representatives of management, labor groups, and the medical department. We recognize that employment is essential to mental, moral, and physical health, and our aim is to restore to safe and useful work those employees who, as a result of injury, or of failing health, or because of disability consequent upon their military service, are no longer fit for their usual jobs. It is easy to see that there rests upon the company medical service a great responsibility in recommending suitable placement of such persons. Problems of insurance, and the existing wage and working agreements between management and labor organizations present certain difficulties in rehabilitation work but, when properly placed, a physically handicapped person, who has the proper spirit, need not be a handicapped worker.

Great progress has been made in both preventive and curative medical care during the past few years. We now have available typhus vaccine, newer methods of malaria control, the powers of penicillin and the sulfonamide drugs, and the life-saving values of blood plasma. However, many medical problems still await solution and in company with the universities, government agencies, pharmaceutical houses, and other groups, the industrial medical centre can, with the cooperation of management and labor, provide its full contribution as a research centre to make new discoveries and particularly to make more effective use of the wide but uncorrelated knowledge and technique that already exists. In short, what the industrial medical centre aims to do in an evolutionary way, because we haven't evolved our final product yet, is to make it fashionable to stay well, to work safely and efficiently, to protect earning power and to seek a great deal more medical treatment than the majority of men would ordinarily obtain were it not for the urging of the industrial medical department.

In our own organization we aim to treat each man as if he was a private patient and to handle him in just the same way as we would the head of the company. We have no use ourselves for a half-way more or less neutral medical organization and we aim to give a medical service that is second to none.

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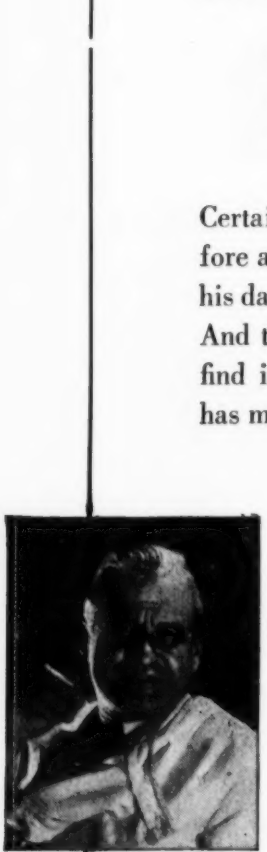

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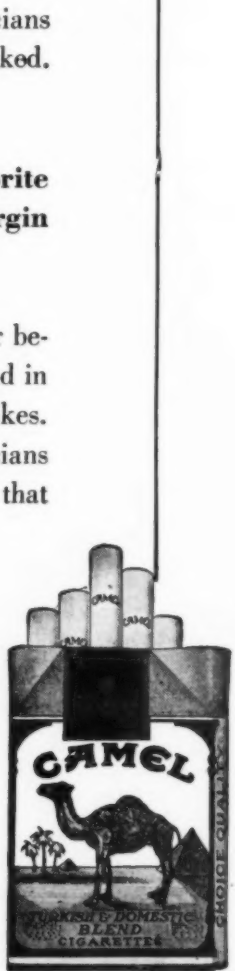

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"Themistocles said that a man's discourse was like to a rich Persian carpet, the beautiful figures and patterns of which can be shown only by spreading and extending it out; when it is contracted and folded up, they are obscured and lost."—Plutarch.

Arthritis

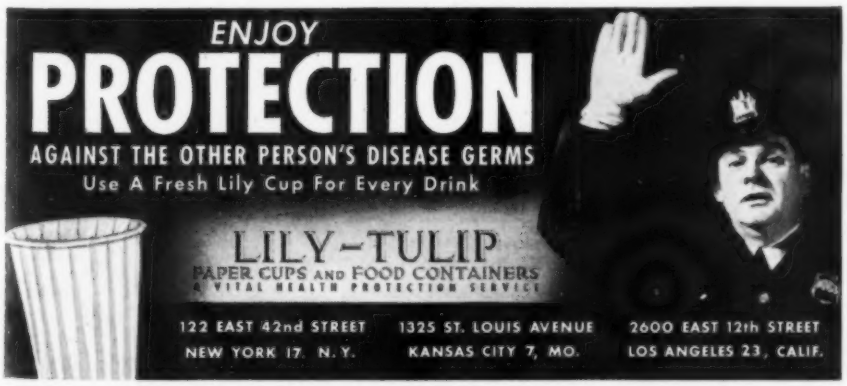
LORING T. SWAIN, M.D., Boston, Massachusetts, "The General Treatment of Arthritis," in *Journal of the Indiana State Medical Association*, 38:12, 487-491, December, 1945. Summary: "The important points which I wish to leave with you are: (1) The arthritic problem in this country is too great for the specialist alone; it requires the cooperation of the general practitioners. (2) Arthritis is a constitutional disease requiring complete and continued treatment from the start. There is no short cut to recovery. (3) In three-fourths of all the cases of rheumatoid arthritis the prognosis for a useful life is excellent if treated early and adequately. One-fourth of these cases require long hospitalization and reconstructive surgery in the hands of specialists. (4) The arthritic problem is of national importance, because of the country's enormous monetary expenditure and work days lost. Anything we can do to stop this loss is our patriotic duty. And now may I add a final thought. In spite of the marvelous advances in science and medicine, there remains the 70% of patients we are asked to treat where there is no organic pathology. These are indicative of the appalling need in the world today for a new spirit. The next great advance in medicine may well be in the doctor himself, when he is willing to assume the responsibility of bringing this spirit to a sick world."

Silicosis Therapy

DRS. D. R. JOHNS and S. J. PETRONELLA, "Aluminum Therapy for Silicosis," in *Monthly Bulletin Indiana State Board of Health*, 48:203, 216-217, (September, 1945); abstr. in *Industrial Hygiene Digest*, December, 1945: "A report on aluminum therapy and prophylaxis, using 276 employees of a foundry, 75 of which completed treatment. Each man was given a thorough examination, including chest x-ray, before and after the 30-40 treatments, which completed the course. The methods of preparing the aluminum and of administration are fully described. The subjects were classified into eight groups before and after treatment, depending on the presence and state of silicosis, and then into four groups indicating the degree of improvement. None of the subjects treated became worse. The authors conclude: (1) 'inhalation of aluminum powder, while not a cure for silicosis, results in the amelioration of symptoms of silicosis and an increased capacity for work in a significant high percentage of cases; (2) inhalation of aluminum powder gives no evidence of toxicity; (3) there is early evidence that aluminum therapy will be of value as a prophylactic measure.' The experiments are still in progress at the plant mentioned and at one other, and fuller results may be expected in the future. (Ed. Note: The data indicate that while 52% of the test subjects with definite evidence of silicosis experienced 'definite improvement,' 62% of those without evidence of silicosis also experienced 'moderate improvement.')"

Examinations in Steel

INDUSTRIAL Health Examinations in the Iron and Steel Industry. American Iron and Steel Institute, 350 Fifth Avenue, New York 1, New York; 25 pp. (October, 1945); abstr. in *Industrial Hygiene Digest*, December, 1945: "This report discusses recommended practices in industrial health examinations especially adapted to the Iron and Steel Industry aimed toward better and more uniform practices. Four principal types of examinations are considered: (1) Primary examination, given to an applicant, is a complete examination for general fitness, discovery of minor disabilities, for an initial industrial health record. (2) Special examination, after illness, injury or transfer, and limited largely to the needs of the occasion, or to special requirements of the job. (3) Secondary examination, given peri-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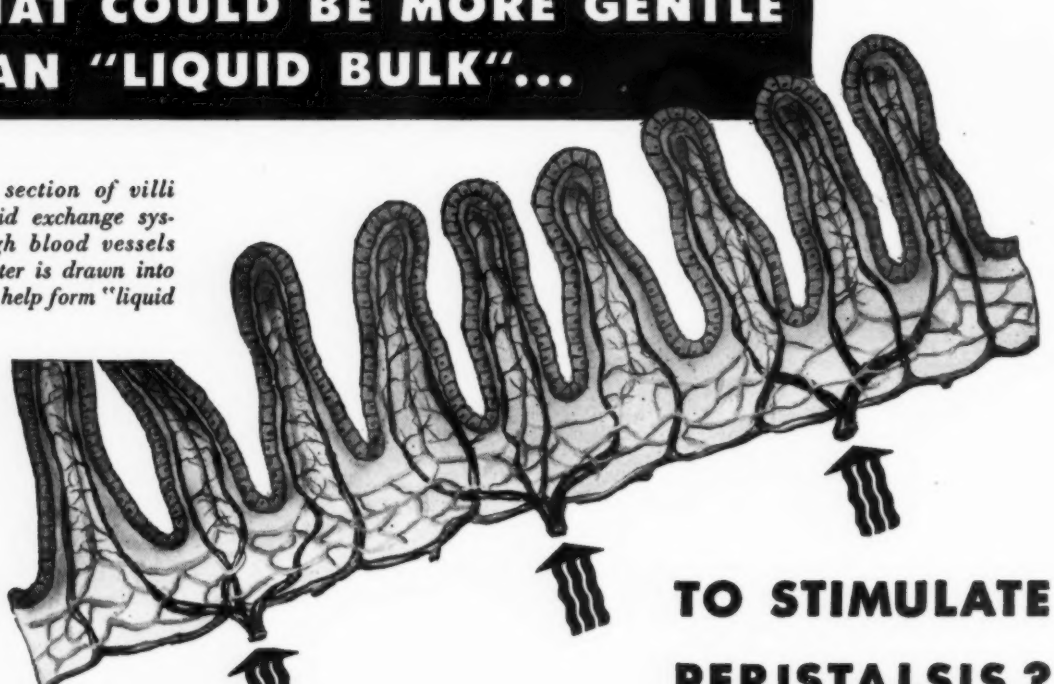

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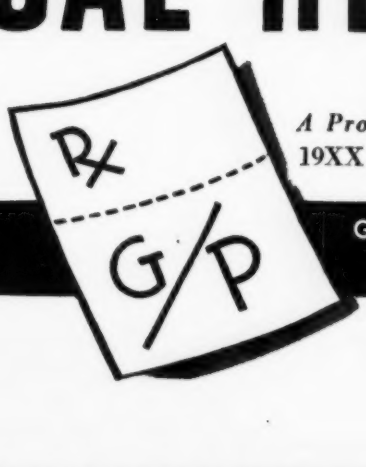

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odically to employees in occupations which involve known health hazards, with a view to protecting the employees. (4) Termination examination, given on termination of employment after illness, injury, or for other causes, in order to determine any ill effects from his employment. The scope of any industrial health examination should be sufficient to provide a reasonable appraisal of the applicant's physical and mental fitness for employment. The examining physician should be familiar with employment requirements in the iron and steel industry, and a female attendant should be present during the examination of women. All findings of a questionable nature should be discussed with the examinee and with his family physician. It is suggested that each applicant be requested to sign a form stating that the medical examiner has informed him of any ailments, defects, or physical or mental disabilities, which have been revealed. Simple forms or recommended methods are presented as general suggestions but many of them may vary with the size of the plant, the executives of which should study, select and adapt the suggestions to their respective requirements."

The Same in Industry

HARRIET L. HARDY, M.D., Cambridge, Massachusetts, "The Clinical Significance of Data Accumulated in the Medical Care of Young Women," published in *New England Journal of Medicine*, 233:26, 811-816, December 27, 1945. Abstract: "Clinicians have not shown great interest in the study of the so-called 'normal.' The physiologists have made useful contributions, but these have not, for the most part, reached the clinician in such a way that he is led to apply the knowledge thus acquired. A review of the literature since 1918 reveals less than 40 references dealing with the subject of normal physical findings as related to clinical medicine. A few of these deserve listing. The Selective Service findings reported and publicized by Rowntree have brought up many questions about supposedly normal and supposedly healthy men. Members of the Grant Study at Harvard University have made some contributions to the study of normality in recent years. Ivy has recently made a most helpful report on this subject. In spite of these scattered reports, it is still true that medicine in all its branches is chiefly concerned with major departures from a supposed norm—gross pathology and lesions that lend themselves to dramatic curative measures. But the expansion of knowledge in bacteriology and its application to public-health practice suggest that in the future the most valuable contributions of medicine will be along the lines of preventive measures. From this concept it seems a logical step to study carefully the normal with all possible variations, especially as they relate themselves to the clinician's problems. This study will lead to knowledge of the ideal base line from which preventive medical measures can be planned. And as variations in the normal are learned in detail, it may become possble to detect the exact point at which a given disease has its onset—knowledge that is badly needed for understanding and prevention. If the foregoing is true, there is distinct help to be had from the day-by-day accumulation of data of a college health service. Here may be found the materials with which to make tables of variables in physical and physiologic findings in young men and women of this particular age group. It is recognized that these persons comprise a selected group who have doubtless received better food and better protection from disease and accident than has the general population; yet there may be found in such data a wealth of material from which to learn the range of the probable ideal normal toward which to work to attain maximum health for the individual. Such knowledge may also prove useful in preventing diagnostic errors due to too narrow an interpretation of laboratory findings. One of the purposes of this paper is to point out the wide ranges of physiologic variation that are possible among normal young women."

Silicosis Among Coal Miners

MAURICE J. SMALL, M.D., Parsons, West Virginia, "A Note on the Occurrence of Silicosis in Bituminous Coal Miners," in *West Virginia Medical Journal*, January, 1946. Text: "It does not seem to be generally known that silicosis occurs rather frequently in miners operating coal cars in bituminous mines as well as among anthracite miners, granite and sandstone cutters. I recall that I was quite surprised when I first began to observe typical roentgen findings of silicosis in this vicinity several years ago, and today when I describe this occurrence to recognized chest specialists I am greeted with the raised eyebrow of skepticism or amazement. That this occurrence is not rare is apparent from the fact that in the past four years we have collected, in a private practice in an area in which the mines are comparatively small, 10 cases in which the clinical and roentgen findings have been typical. Two of these developed silicotuberculosis. In one of the latter cases I had the privilege of performing postmortem examination. The tissues were sent to the National Institute of Health; pathological examination confirmed the clinical diagnosis and chemical examination revealed over 30% silica. Many of these cases were subjects of court litigation for compensation, their films made and seen by specialists from many parts of the country, and their compensation awards won. For some time we were puzzled as to why silicosis should occur in soft coal miners, since it is known that inhalation of carbon dust alone does not produce silicosis. As we began to collect more of these cases we found one factor common to all of them: They all 'worked on the motor,' that is, they operated the cars that hauled the coal from the pit to the surface. The grade being quite steep in this ascent, sand is sprinkled on the wheels to increase traction, and this is ground into a heavy cloud of dust of sufficiently small particle size to cause silicosis. This hazard has been recognized by the coal companies and in recent years masks have been issued to the miners thus exposed. However, new cases continue to appear, perhaps to some extent because the miners are delinquent in wearing their masks constantly, and I believe that if others working in coal mining regions are on the alert for cases of silicosis in coal car operators, many more will be found. This will be particularly true if a chest film is obtained in every miner complaining of cough or dyspnea, no matter how slight, if a history of 'working on the motor' or near it can be elicited. In this connection it is interesting to note that PENDERGRASS in a recent issue of *J.A.M.A.* reports one typical case among five of benign pneumonoconiosis due to finely divided iron dust from metal grinding. This one case, unlike the others, had symptoms referable to the respiratory tract and a chest roentgenogram highly suggestive of silicosis. The diagnosis of silicosis, however, is questioned in this case because this patient 'never mined coal.' He had, however, been 'a coal car operator,' and it would be interesting to know if the above explanation is pertinent in this instance. Although this patient did not develop respiratory symptoms until 16 years after having left the mines, this interval in our experience is not incompatible with the diagnosis of silicosis."

Effect of TNT

RUDOLPH F. SIEVERS, Passed Assistant Surgeon, ALFRED H. LAWTON, Passed Assistant Surgeon, FOLKE SKOOG, Associate Physiologist, PAUL A. NEAL, Medical Director, W. F. VON OETTINGEN, Principal Industrial Toxicologist, ROBERT L. STUMP, M.D., and A. RALPH MONACO, Passed Assistant Surgeon (R), "A Medical Study of the Effect of TNT on Workers in a Bomb and Shell Loading Plant and Report of Fatal Case of Aplastic Anemia," in *U. S. Public Health Service Bulletin No. 291*, 1945. Summary: "It was the purpose of this study to determine the extent and degree of incipient TNT intoxication among workers in a modern bomb and shell loading plant after approximately one year of operation. Simultaneously it was intended to evaluate criteria essential for efficient periodic examination, to evaluate findings from laboratory animals exposed to TNT, and to give trial to several new clinical procedures suggested for detection of incipient TNT intoxica-

tion. Particular attention was given to investigating TNT intoxication in relation to dietary factors and to differences between sexes. The field investigation consisted in a medical study of 250 men and 103 women working with TNT and 55 men and 50 women working in the same plant without exposure to TNT. Identical clinical and laboratory procedures were used to study each of the four groups. The exposed men had been employed for an average of eight months and the women slightly over three months. Various jobs performed during the loading of bombs and shells are described in order to delineate for the reader, the degree and type of exposure to which workers were subjected. No cases of severe TNT intoxication were seen. On the basis of history and physical examination, 21 of the exposed workers were classified as showing signs of early or mild TNT intoxication. The laboratory tests gave supportive evidence of TNT intoxication in some cases. No single test was found reliable for diagnosis of TNT intoxication in its earliest stages. The most significant laboratory findings proved to be a decrease in hemoglobin values, hematocrit readings, or erythrocyte counts and a slight increase in icterus index and urinary coproporphyrin levels. These tests are valuable tools and, with the exception of the latter, should be performed once a month routinely on all workers exposed to TNT. Hematologic studies revealed 14 exposed men with moderately severe anemia, three of whom were also included in the group showing mild TNT intoxication. The anemia was of the hypochromic type; evidence is presented to show that the hypochromia was partially caused by destruction of hemoglobin within the erythrocyte. The altered hemoglobin which appears as turbid material in hemolyzed blood is denatured globin which can be measured by a spectrophotometer. When present in sufficient quantity and properly stained this turbid material has been identified as Heinz bodies. No diagnosis was made of either toxic jaundice or aplastic anemia among the workers, although one worker among the 14 anemic cases did develop aplastic anemia, from which he subsequently recovered five or six months after the completion of this investigation. The icterus index of the group of exposed workers was slightly but significantly elevated. Some of the icterus indices fell within the range of latent jaundice; only one was sufficiently elevated to be associated with clinical jaundice. Contrary to general belief and expectancy, women were found to be less affected than men by TNT exposure. There were only two women in the group of 21 cases of mild TNT intoxication and not a single woman developed anemia up to the time of this study. Fewer physical complaints were reported by women than men, which may be partly ascribed to their shorter period of employment. However, the greater depression of erythrocyte counts, hemoglobin values and total cell volumes of male workers as compared to the female workers was not found to be correlated with either the exposure period or variation in jobs. Exposed women did report various menstrual changes following employment but these may be attributable to physical activities associated with the work rather than to TNT exposure. On the whole, the workers studied have excellent dietary histories and all four groups showed weight gains after employment. This is attributed to better incomes and improved eating habits. The number of men and women who lost more than five pounds after their preplacement examination was very small; however, a weight loss of more than five pounds was associated with TNT intoxication in several instances. Neither milk nor vitamin C could be shown to demonstrate any definite protection against TNT poisoning in this study. Milk consumption did appear to be correlated to a lower incidence of complaints referable to the gastrointestinal tract. Certain complaints occurred more frequently among the exposed group of workers than among the controls. Those reported most often were fatigue, malaise, or drowsiness, anorexia, nausea and vomiting, abdominal pain, headache, dizziness, and polyuria. In addition, cyanosis and pallor were frequently observed in these workers. The cause of cyanosis is unknown; it cannot be ascribed to the low levels of methemoglobin found in the blood of these workers. No correlation was found between pallor and altered hemoglobin values or red cell counts. About 10% of the exposed employees were found to have a mild dermatitis upon examination but it was reported by 40% of them at some time during exposure, usually in the first month. The occurrence of right upper quadrant tenderness of the abdomen was slightly more frequent among exposed than nonexposed workers. There was a slight depression of the mean systolic and diastolic blood pressures of men exposed to TNT. The mean systolic and diastolic blood pressures of exposed women remained unchanged. An analysis of electrocardiographic data showed an increase in the mean height of T waves in all four leads of the group of men exposed to TNT. No suitable explanation has been offered for this phenomenon. The group of exposed women did not demonstrate any alteration of the T waves. The electrocardiographic tracing did not reveal any other deviation peculiar to exposed workers. The cardiac response to exercise as determined by the pulse rate was good for all groups of workers. A new urinary amine test devised by Snyder and von Oettingen was found a more reliable index of TNT absorption than the Webster test. The average daily amine excretion is twice as great for men as for women. No correlation has been found between amine excretion and TNT intoxication. Other laboratory findings of lesser importance demonstrating slight changes include: increased methemoglobin content of the blood of exposed workers, but not to the degree to interfere with oxygen transport or to produce cyanosis; a shortened coagulation time and dark colored urine. Laboratory findings in which no changes were noted include the sedimentation rate, reticulocyte count, differential white cell count, and urinary volume, specific gravity, albumen, sugar, and urobilin. In addition to the plant study, a fatal case of toxic hepatitis and aplastic anemia following TNT exposure has been reported."

Occupational Dermatoses

DISTURBANCES of the skin due to occupational factors have come to be recognized as a serious cause of disability among workmen at certain jobs. The relatively high incidence of such disturbances in general and in specific occupations is well known. The increase in the number of cases associated with war industries has been startling in certain industries. An article appearing elsewhere in this issue of the *Journal*, (Occupational Dermatoses: Disability and Compensation," by C. GUY LANE, M.D., Boston, *New England J. Med.*, 233:24, 711-715, December, 1945), however, points out that little information is readily available regarding the toll that these diseases take in terms of compensation paid to the worker, the sums spent for medical treatment and hospital care or the duration of disability. The data that are available reveal how costly such conditions have become in the modern world of production and still more production. In the opinion of authorities in this field many of these losses are preventable, at least under peacetime conditions, if full advantage is taken of the principles of preventive medicine and the knowledge of corrective measures developed in the last few years, but it may take the full impact of the statistics of the end results and the costs of such disabilities to focus the requisite attention on these cases. It is recognized, of course, that industrial accidents produce greater losses, but with occupational dermatoses accounting for 60% to 65% of all occupational disease, their cost, figured in time and in dollars and cents, is a sizable one in the aggregate. . . . Although much has been learned about occupational dermatoses by the Office of Dermatoses Investigations of the U. S. Public Health Service and much has been accomplished in the way of their detection and prevention, the development of accurate statistics covering the losses resulting from such cases would without question stimulate a greater interest in them and their prevention.

—Editorial in *New England J. Med.*, 233:24, 745, December 13, 1945.

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